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Assessment of emerging employment and decent work opportunities and challenges in the forest sector

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Abbreviations

AFR100	African Forest Landscape Restoration Initiative	NbS	nature-based solutions
EU	European Union	NGO	non-governmental organization
FAO	Food and Agriculture Organization of the United Nations	NWFP	non-wood forest product
FPO	forest producer organization	PEFC	Programme for the Endorsement of Forest Certification
FSC	Forest Stewardship Council	REDD+	Reducing emissions from deforestation and forest degradation, conservation of existing forest carbon stocks, sustainable forest management and enhancement of forest carbon stocks
FTA	forest, tree and agroforestry	SDG	Sustainable Development Goal
GDP	gross domestic product	SMFE	small and medium size forest enterprise
GKNP	Greater Kruger National Park	TJ	terajoule
ha	hectare	UN	United Nations
ILO	International Labour Organization	USD	United States dollars
IPCC	Intergovernmental Panel on Climate Change	WTTC	World Travel and Tourism Council
IUCN	International Union for Conservation of Nature	ZAR	South African rand
MRV	monitoring, reporting, verification		

Glossary

Bioeconomy refers to the sustainable production, utilization, conservation and regeneration of biological resources, including related knowledge, science, technology and innovation, to provide information, products, processes and services across all economic sectors aiming towards a sustainable economy (IACGB, 2020).

Decent work “involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for all, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men” (ILO, 1999).

Green economy is “low carbon, resource efficient and socially inclusive. In a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that

allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services” (UNEP, 2011).

Green jobs refer to “decent jobs in any economic sector (e.g. agriculture, industry, services, administration) which contribute to preserving, restoring and enhancing environmental quality” (ILO, 2023).

Nature-based solutions (NbS) are “actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits” (ILO, UNEP and IUCN, 2022, p. 32).

Executive summary

Background and the aims of the report

Full and productive employment, as well as decent work, are crucial for human welfare, inclusive economic growth, and socially sustainable development. Globally, in most rural areas, employment is mainly provided in agriculture and forestry, but in recent years there has been an overall decline in forest-related employment. Today, global megatrends renew traditional forest-sector employment and can provide new employment opportunities. The interlinked long-term environmental, socioeconomic and political trends and technological development are leading to changes in forests and how they are used and valued. This includes changes in forest cover and condition, forest biodiversity, how and for what forests are used and managed, what kinds of products are produced from wood and non-wood raw materials, where production is taking place, and, more generally, how the range of forest ecosystem services are valued, sustained and supported.

Together with technological developments, forests have an important role in addressing current environmental and social challenges by transitioning towards more sustainable production and consumption through the use of bio-based raw materials and renewable energy, and innovative nature-based solutions (NbS). These development trends also lead to changes in the nature of forest-related work and the skills and capacities needed.

This report has four specific goals. First, it assesses the possible impacts of megatrends on employment in the forest sector, focusing on the impacts on current employment as well as the potential for emerging opportunities. Second, the study assesses current decent work challenges in the forest sector, and pinpoints key issues that are likely to develop alongside emerging employment opportunities. Third, employment opportunities and challenges in different forest industry subsectors are assessed. Finally, policy recommendations are presented based on the findings of previous chapters. The report is based on existing literature, includes examples from different parts of the world and presents possible impacts on youth and women.

Main opportunities and challenges

At the global level, demand for wood is projected to increase. Millions of additional hectares of plantation forests will be needed to supply the quantities of wood required for this estimated demand. This, combined with commitments by national governments and other actors towards restoring millions of hectares of degraded and deforested areas to provide various ecosystem services, will likely create new employment opportunities. These employment opportunities are likely to be in both forestry and in restoration activities, in subtropical and tropical areas. Furthermore, increasing demand for wood creates opportunities to increase community and smallholder tree planting. Due to a lack of secure land rights or recognition of existing land rights, large-scale logging concessions and plantations have contributed to conflicts with local and Indigenous communities, leading to loss of employment when productive activities on the land have been ceased. The possibility that large-scale restoration efforts may include similar risks should be taken into account.

Growing need for wood products creates opportunities to develop wood manufacturing industries and related exports. At the same time, manufacturing is benefitting from technological development, mills are being modernized, and productivity is increasing. In the future, fewer workers will be needed for produced unit (cubic metre, tonne), and the need for a skilled labour force will increase across forest sectors (e.g. manufacturing as well as in forestry and restoration).

The growth of nature-based tourism is based on global trends like urbanization, socioeconomic changes and higher incomes. In many countries, there is optimism about the development of nature-based tourism. Because nature-based tourism businesses are typically located in rural regions, there are also aspirations for diversifying rural livelihoods. To generate significant employment and income impacts, services in nature-based tourism should be provided, as much as possible, by local people and by using local inputs. This is not always possible. For example, because of a lack of needed skills, benefits may leak outside the local economy or even abroad. If, however, tourism creates positive economic impacts on the local economy, it can lead to greater acceptance of conservation actions, and benefit them. Tourism that is too intensive may, however, create negative cultural and environmental impacts.

Traditional wood energy (fuelwood and charcoal) will remain the principal energy source in sub-Saharan Africa and parts of Asia for the coming decades, providing employment for a large number of people. An important challenge is to improve the sustainability of fuelwood production and address the informality and illegalities in the sector.

Non-wood forest product (NWFP) production and NWFP-based value chains can provide new opportunities for employment and income. In general, lack of capacities, resources and market access limit smallholder and community opportunities to establish plantations or restore degraded areas, as well as limit the ability to commercialize NWFPs.

The forest sector faces serious decent work challenges, which are connected to the breadth of informal work in the sector as well as the nature of the sector. In the pulp and paper industry, the role of informal work is remarkably smaller than in other subsectors but still significant in some regions of the world. Informal employment is common in logging operations, charcoal production, fuelwood and NWFP collection, and in wood and wood products manufacturing in lower income countries. Women are more often informally employed than men. Decent work challenges are also common in the tourism sector.

Recommendations

Decent work should be mainstreamed within forestry work and throughout forest-related value chains and industries, as well as in nature-based tourism. Specific attention should be paid to the most vulnerable groups, including women and youth. Ensuring social protection for forest-sector workers is challenging due to the high levels of self-employment, temporary and seasonal work, subcontracting, and the pervasiveness of the informal economy. The primary responsibility of providing and expanding comprehensive coverage of social protection is first and foremost with the state, but it can also be advanced through forest producer organizations (FPOs) or other social organizations. Governments should also ensure that businesses put into practice their responsibility to respect human and labour rights throughout their operations.

Enabling environment for developing forest-based activities and entrepreneurship is crucial for all forest-related economic activities – from smallholder woodlots and small and medium size forest enterprises (SMFEs) to large international companies – and it forms the basis for creating and supporting employment opportunities and decent work. Developing SMFEs has an important role

in this as they provide most of the forest-sector employment globally and hold considerable potential for future development. While the specific supporting conditions vary depending on the scale and nature of activities, some general issues are important across scales and actors. Along with adequate infrastructure and access to markets, these conditions include peace, stability, and good governance, which involves the rule of law, secure and clear property rights, enforceable contracts, accountability, and transparency, as well as curbing corruption and illegal activities. Possible government actions include strengthening land and resource rights; encouraging and enabling forestry workers, forest producers and employers to organize and profit from new opportunities provided by technological innovation and digitalization; and building an enabling environment for SMFEs by simplifying regulations and bureaucratic procedures. For attracting large- or medium-scale investments governments should, among other issues, decrease the investment risks of companies by paying special attention to development of well-functioning institutions, rule of law and social stability, and to securing a sufficient and educated workforce. Furthermore, governments should promote and encourage the leading role of large companies in inclusive forest value chain development including provision of decent employment opportunities, particularly for the rural poor.

Continuing deforestation and forest degradation threaten the provision of different forest ecosystem goods and services and thus also sustainable forest-based employment in the long run. A fair, more inclusive and environmentally sustainable development model requires that economic growth is reconceptualized and decoupled from resource degradation and the trade-offs between agriculture, forest and mining sectors are addressed in a fair and sustainable manner. **Streamlining conflicting policies and eliminating policies that undermine sustainable forest management** by enabling or even incentivizing forest clearing (e.g. for agriculture and mining) is important for securing an adequate resource base for future needs and future employment. In addition, the future of forests is also increasingly influenced by climate, energy, water and infrastructure policies, as well as economic and investment policies. It is important to carefully **consider the trade-offs among the different sectoral policies from the point of view of employment**, taking advantage of the possibilities for positive synergies in employment creation. Governments should also ensure that decent work aspects are mainstreamed across policies and that impacts on women and youth are considered. The forest sector is increasingly interlinked with other industries and a part of future forest-based employment will realize outside of the traditional forest sector, in sectors such as textiles and construction. If governments are aiming at substitution of non-renewable materials with wood products, they should create policies favouring sustainable use of wood over other materials (for example, by means of public procurement). However, it should be noted that this can decrease employment in other sectors.

Lack of data and information undermines the development of policies and measures to support decent work and create employment opportunities in many countries. Responding to many of the above-mentioned development priorities requires reliable information on the current situation and challenges, including information on informal employment. Tracking of changes in the forest-sector operating environment, investments and societal changes that affect the demand for forest-based goods and services is also needed for anticipating future changes and labour needs in the forest sector.

Education and training programmes need to be developed and tailored to respond to future needs in skills and capacities. Currently, the lack of skills significantly restricts development of the forest sector and the production of higher value-added products in many lower income countries. Governments should have long-term plans for developing forest education and training, based on a thorough assessment of current skills, age profiles and identification of current and future skill needs. These plans should consider the changing circumstances and related forestry labour needs in a bioeconomy and the increasing role of forest-based services in relation to culture, health and nature-based tourism. They should also specifically focus on developing the skills and capacities of women and youth for improving their opportunities to

participate in and benefit from forest-based activities. In low- and lower middle-income countries especially, increased training should be used to develop the skills of forest and wood workers, and workers in the wood products industry, to improve productivity, work safety and job security, and to reduce negative environmental impacts of operations. Similarly, in nature-based tourism, skill development is important to enable the use of local service providers and the use of local inputs, thus preventing leakage of benefits and providing employment opportunities for women and youth. Capacity building on issues related to entrepreneurship, including financial and operational management and planning, are needed. Globally, more specialized forest management skills are also needed to answer to the multiple demands for forests and the growing importance of different forest goods and services. This includes capacity to adopt new technologies and more sustainable production methods, new skills for adopting green production processes and value chains in relation to new products, capacity to utilize renewable energy and use of wood in construction.

1. Introduction

1.1 Background and aims of the report

Full and productive employment and decent work are crucial for human welfare, inclusive economic growth and socially sustainable development. The United Nations Sustainable Development Goal (SDG) 8, decent work and economic growth, specifically addresses these issues. The United Nations 2030 Agenda for Sustainable Development also acknowledges the important synergistic interlinkages among SDG 8 and other SDGs, especially poverty alleviation (SDG 1) and eradication of hunger (SDG 2). In most rural areas employment is mainly provided in agriculture and forestry, but over the past years there has been an overall global decline in forest-related employment. However, global socioeconomic megatrends and the important role that forests have in addressing current environmental and social challenges, together with technological development, the transition towards more sustainable production and consumption, and the use of bio-based raw material and renewable energy, and innovative nature-based solutions (NbS), are renewing traditional forest-sector employment and providing new employment opportunities. These development trends will also lead to changes in the nature of forest-related work and the skills and capacities needed.

This report has four specific goals. First, it assesses possible impacts of megatrends on employment in the forest sector. Impacts on current employment as well as potential for emerging opportunities are examined. Second, the study assesses current decent work challenges in the forest sector and pinpoints key issues that are likely to develop alongside emerging employment opportunities. Third, employment opportunities and challenges in different forest sector subsectors are assessed. Finally, based on the findings of previous chapters, policy recommendations are presented. The study focuses especially on countries in Africa, Asia and Latin America, but also provides examples from other parts of the world. Possibilities to promote formal employment as well as improve decent work opportunities for women and youth are emphasized. The study is based on existing literature.



1.2 Introduction to environmental and socioeconomic megatrends

Forests provide important ecosystem services that contribute to all aspects of human well-being and are crucial for global sustainability and sustainable development. Forests harbour a major part of the global terrestrial biodiversity, are crucial for carbon sequestration and storage, regulate water flows and water quality, and provide wood and non-wood forest products (NWFPs) for subsistence use and for sale. They hold important cultural and spiritual values and provide an environment for recreation and tourism. Forest-related activities, value chains and industries provide employment and are especially important for rural livelihoods and rural development as well as the national economies in many countries (Li *et al.*, 2022). Forests and forest employment are either directly or indirectly crucially important for billions of people: a major part of the rural population in the world lives within 5 km of a forest of at least 1 ha (Newton *et al.*, 2022) and, on average, 22 percent of total household income across 24 countries in the tropics and subtropics originates from forests (Angelsen *et al.*, 2014). Furthermore, globally, at least 3.5 billion people are estimated to use NWFPs (Shackleton and de Vos, 2022).

The future of forests, the forest sector and forest-sector employment are influenced by interconnected long-term global trends. A scan of recent analyses of megatrends concluded that the main driving forces of societal change can be grouped under technological development (e.g. innovation, increasing connectivity, changing work), demographic changes (e.g. population growth, shifting age structure, migration), environmental pressures (climate change, resource scarcity), and socioeconomic and political changes (e.g. shifts in economic and political power, inequality) (Artuso and Guijt, 2020). Focusing on the important trends affecting forests and forest-based livelihoods, Oldekop *et al.* (2020) identified the following trends: rural demographic change, increased affluence of the populations in low- and middle-income countries, digital technologies, forest disturbances, and large-scale infrastructure development. Furthermore, unsustainable natural resource use and extraction has led to continuing degradation of the Earth's ecosystems and increasing loss of biodiversity (EEA, 2015). These trends are intrinsically interlinked, and they can have synergistic or antagonistic influences on forests, the forest sector and related employment. How the trends will influence forest-related employment is shaped by socioeconomic and environmental conditions and policies that affect them.

1.3 Important megatrends from a forest sector and forest use perspective – an overview

1.3.1 Demographics, migration and urbanizing middle class driving forest use change

The world population continues to grow and migrate, resulting in increasingly urban and middle-class populations associated with higher per capita commodity and energy consumption. The global population is projected to reach 9.7 billion in 2050. Most of the population growth will take place in Africa and more than half of the growth is expected to take place in sub-Saharan Africa (UN DESA, Population Division, 2022), leading to a considerable increase in working age population. Creating employment for an increasing young workforce in urban and rural areas is one of the main social challenges in sub-Saharan Africa (Fox and Gandhi, 2021). However, in many middle- and high-income countries, population growth is slowing and starting to decrease. In Europe and Eastern Asia the population is ageing (UN DESA, Population Division, 2022), leading to shortages of workers in some countries (Owour *et al.*, 2021).

The growing world population is increasingly concentrated in urban areas. The share of urban residents is projected to rise from 55 percent in 2018 to 68 percent by 2050. Most high-income and many middle-income countries are already highly urbanized. Almost 90 percent of the growth in urban population will take place in Africa and Asia (UN DESA, Population Division, 2019). The growth of the middle class has been fast, especially in Asia. In India and China, the rapid growth of the middle class has occurred in parallel with economic growth.

Urban population increase involves two mechanisms: population growth within urban areas and rural-urban migration, which is also related to growth of the rural population. The reasons behind migration

from rural to urban areas as well as behind international migration are complex. Often, they relate to lack of livelihood opportunities or adverse environmental conditions, but can also include cultural, social and political reasons, including conflicts (Mercandalli and Losch, 2017). The number of internal migrants (i.e. people moving within a country) has been estimated to be 740 million globally in 2009 (UNDP, 2009). In comparison, the number of international migrants is much lower but has increased during the past decades and was in 2020 estimated to be around 281 million people (i.e. about 3.6 percent of the global population) (McAuliffe and Triandafyllidou, 2021). Migration also involves an important transfer of funds to low- and middle-income countries, which can in some cases support investment in more sustainable or productive agriculture, reducing pressure on forests and increasing tree planting (López-Feldman and Chávez, 2017; Sunam, Barney and McCarthy, 2021). International remittances to low- and medium-income countries, excluding China, was estimated at over USD 605 billion in 2021 and they have for the past decade been about three times the volume of official development aid (Ratha *et al.*, 2022).



Migration is not unidirectional, but rural–rural migration and temporal, circular or seasonal migration are also common phenomena (Mercandalli and Losch, 2017). Negative impacts of climate change and land degradation on food security and livelihoods are further expected to increase migration and are projected to force 50 million to 700 million people to migrate by 2050. Extreme climate events such as droughts, floods and storms are the most common drivers for migration (IPBES, 2018). Migration can also increase pressure on land and resources in destination areas, leading to increased deforestation and land degradation.

When combined with employment opportunities in other sectors and agricultural intensification, rural–urban migration can lead to abandonment of agricultural lands and to spontaneous forest expansion, as in many European countries. In countries with more recent forest transition (i.e. transition from decreasing to increasing forest cover), the underlying changes and drivers have been diverse. In Latin America and the Caribbean, Nanni *et al.* (2019) found reforestation to be linked to “topographical roughness and related aspects of agro-ecological marginality, climate, population trends, and degree of urbanization”. They concluded that in most cases reforestation was linked to abandonment of land due to socioeconomic changes.

In some countries, government policies involving economic incentives for reforestation (South Korea, Bae, Joo and Kim, 2012 and Viet Nam, Cochard *et al.*, 2017) or development of other sectors and the discouragement of small-scale agriculture (Costa Rica, Allen and Vásquez, 2017) have had a central role. International programmes and initiatives also have an important role in supporting and financing land and forest restoration and tree planting. In the Sahel region international non-governmental organization (NGO) programmes, and in East Africa United Nations and NGO campaigns, such as the Green Belt Movement, have increased tree planting on smallholder lands (Rudel *et al.*, 2020). An example of a major international initiative that brings together United Nations organizations, the European Commission, the World Bank and the International Union for Conservation of Nature (IUCN), is the African-led Great Green Wall movement to restore 100 million ha of degraded landscapes of the Sahara and the Sahel. The Great Green Wall movement is currently implemented across 22 African countries. It also aims at creating 10 million jobs by 2030.¹

Increasing population, urbanization and a growing middle class increase the demand for energy (Never *et al.*, 2020), materials, including building materials, and agricultural products, especially the consumption of meat and dairy products (FAO, 2022a). It is estimated that the demand for wood products will increase by 37 percent from the 2020 level by 2050, and that the demand for industrial roundwood will increase by between 25 percent and 45 percent during the same period (FAO, 2022c). Substitution for non-renewable materials will further increase the demand. Increasing energy demand is likely to increase both the use of woodfuel (especially in Southern Asia and sub-Saharan Africa) and the use of modern biomass energy (FAO, 2022c).

Increasing incomes, urbanization and related changes in values will also increase demand for green spaces, outdoor recreation and tourism. An important share of tourism relates to nature and forested areas. The important role of urban green spaces, and urban and peri-urban forests for human welfare, resilient cities and sustainable development is increasingly recognized (Borelli, Conigliaro and Pineda, 2018).

1.3.2 Shifting economic and political powers and increasing inequality

The world is progressively more connected, through increasing international trade, travel, internet access and social media. The trade in roundwood and forest products has increased substantially during the past decades and the role of south–south trade has grown. Asian countries, especially China and India, are importing an important share of the global forest products trade. Together China, India and Brazil consume about 50 percent of the global production of tropical timber (Roda *et al.*, 2011).

The economic and political powers are shifting. Even with the current global economic downturn, which will likely affect growth in the coming years, economic growth seems to be shifting towards Asia (Forbes, 2022).

¹ Great Green Wall Initiative: <https://www.unccd.int/our-work/ggwi>, cited 29 May 2023

These changes have important implications to global trade flows, including timber and value-added forest products, and investments.

The current social and political changes are increasing inequalities between and among countries and while part of the population is becoming more affluent, another part is falling further behind. The slightly positive development trends already achieved during recent years in respect to poverty reduction, health and food security have been seriously disrupted by the economic downturn following the COVID-19 pandemic, which has led to deterioration in all these issues and has further exacerbated existing inequalities. Globally, disruptions caused by the pandemic, including loss of jobs, led the number of people living in extreme poverty (living on less than USD 2.15 a day) to increase by 70 million to a total of 700 million people. A large majority of the poor live in rural areas (World Bank, 2022). The pandemic led to loss of employment that corresponds with an estimated 52 million full-time jobs. Women, migrants and youth have suffered disproportionately more from the loss of employment. Full recovery to a pre-pandemic employment situation is projected to take years. The recovery has also been uneven across countries, and labour markets in low- and middle-income countries have recovered significantly less than in richer countries (ILO, 2022a).

1.3.3 Technological development posing new requisites for employment

After the COVID-19 pandemic, in low- and lower middle-income countries, informal employment has grown more or at an equal pace with formal employment (ILO, 2022b). The pandemic also strengthened changes in the labour markets that could in the long term lead to structural changes. It has accelerated technological change and the digital divide between and within countries, and led to increases in remote work, informal self-employment, and temporary work – all with implications for employment and decent work (ILO, 2022a).

Technological changes related to information and communication technologies, nanotechnologies and biotechnologies are particularly important for the future of forests and can support more sustainable use of resources, mitigate negative environmental impacts and reduce the use of non-renewable resources (EEA, 2015). Rapid development of information and communication technologies has led to profound changes in the capacities to collect, process and transfer information. Increasing access to internet and mobile phones facilitates the collection, availability and use of forest-related information on, for example, forest extent and condition, connects producers to consumers, and enables access to market information (Oldekop *et al.*, 2020). In general, technological change, automation and advances in biotechnology and digitalization replace labour, reallocate economic activity across sectors and create new tasks and job opportunities, which require special skills and reduce employment opportunities for low-skilled workers (Charles, Xia and Coutts, 2022).

Advances in biotechnology can, for example, increase the effectiveness of forest production, especially in plantations, through improved planting material and support measures to increase forest adaptation to changing climate (Sahoo and Wani, 2020). Technological development and innovation are also introducing new value-added products, and substitute products for non-renewable materials. Of the latter, the use of mass timber and engineered wood products in construction, and manufactured cellulose fibres for textiles, are currently the most promising for wider use (Verkerk *et al.*, 2022).

1.3.4 Deforestation and forest degradation affecting employment potential of the forest sector

The above described demographic and technological changes affect forests and transform the forest sector's potential to offer employment. In many parts of the world forest areas are still declining in the face of pressures from agriculture, infrastructure, urban expansion and extractive industries. Increasing commodity demand is driving the expansion of commercial agriculture and has expanded large-scale land acquisitions. The Land Matrix database records indicate that since 2000, there have been 2 198 concluded transnational land deals of over 200 ha covering 64.79 million ha and 1 151 domestic deals covering

21.51 million ha.² From 1990 to 2020, deforestation (which refers to conversion of forest to other land uses) totalled an estimated 420 million ha, of which 90 percent took place in the tropics. Since 1990, global primary forest area has decreased by over 80 million ha. The annual deforestation area has decreased from 15.8 million ha/year in 1990–2000 to 10.2 million ha/year in 2015–2020 (FAO, 2020). The reduction is partially due to afforestation and the resulting increase in planted forests area, especially in Asia. Planted forests refer to forests that are predominantly composed of trees established through planting and/or deliberate seeding. Plantation forests are a subcategory of planted forests and refer to intensively managed planted forests that at maturity are composed of one or two species, have one age class and regular tree spacing (FAO, 2018). Planted forests currently account for about 7 percent of the global forest area and are established for providing different ecosystem services, while forest plantations (45 percent of planted forests, but with large regional differences) are mainly established for timber production. Forty-four percent of forest plantations use introduced tree species (FAO, 2020). Based on historical trends, plantations are estimated to provide 33 percent of global industrial roundwood demand (Mishra *et al.*, 2021). The area of planted forests has increased at an annual rate of about 1 percent between 2015 and 2020 (FAO, 2022a). To respond to the estimated increase in demand, more intensive production in existing plantations and the establishment of new plantations are needed (FAO, 2022c).

According to the Food and Agriculture Organization of the United Nations (FAO) Remote Sensing Survey, cropland expansion accounted for more than 50 percent of global deforestation and increase in livestock grazing about 40 percent, together accounting for about 90 percent of deforestation worldwide from 2000 to 2018. Cropland expansion dominated in Asia and Africa, and expansion of grazing dominated in Latin America (FAO, 2022d). Plantations for soy and oil palm continue to dominate in Latin America and Asia. Small-scale subsistence agriculture dominates in Africa, but market-oriented smallholder production has also increased in Western and Central Africa, mainly for cocoa (Honosuma *et al.*, 2012; Pacheco *et al.*, 2021). The future of forests is thus crucially linked to successful transformation from current unsustainable agricultural practices towards sustainable ones. This transformation is further challenged by climate-change induced droughts, floods and increased temperatures. Climate change increases the prevailing risk of food insecurity and hunger. A projected 8 percent of the global population may suffer from hunger in 2030 (FAO, 2022b).

Expanding urban areas, settlements, infrastructure and extractive industries, for example mining, are increasingly driving deforestation. Urbanization and infrastructure development accounted for just over 6 percent of global forest conversion in 2000–2018 (FAO, 2022d). Steady expansion of road networks drives agricultural expansion and extractive industries by increasingly connecting international and domestic markets to previously remote rural areas. Growing energy needs are driving hydropower development, especially in Latin America and some Asian countries but also increasingly in Africa (Pacheco *et al.*, 2021).

In addition to deforestation, biodiversity and the provision of forest ecosystem services are seriously undermined by forest degradation, involving change in forest structure and loss of productivity and forest ecosystem services. Reliable global data on degradation does not exist but a significant area of tropical forest is estimated to be degraded (FAO, 2020). The drivers of degradation differ from those of deforestation and include timber extraction and logging (especially in Asia and Latin America), fuelwood collection and charcoal production (especially in Africa), and uncontrolled fire and livestock grazing (Hosonuma *et al.*, 2012).

Furthermore, illegal forest activities (including harvesting, transporting, processing, purchasing or sale of forest products in violation of national laws) contribute to deforestation and degradation, have negative impacts on local livelihoods, distort markets and undermine incentives for sustainable forest management. They are often linked to corruption and lack of secure land and resource rights of rural communities and Indigenous Peoples (FAO and UNEP, 2020).

² Land Matrix database: <https://landmatrix.org/list/deals>, cited 17 January 2023

1.3.5 Addressing climate change and biodiversity decline may offer new employment

Forest degradation and deforestation contribute to climate change and curtailing these trends, together with promoting sustainable management of forests and increasing forest and tree cover, are important for mitigating and adapting to climate change. Global commitment to limit the global temperature rise below 1.5 °C compared with pre-industrial levels will not succeed without harnessing the full potential of forests to mitigate temperature rise. In the latest Intergovernmental Panel on Climate Change (IPCC) synthesis report, reducing the conversion of natural ecosystems was identified as the most feasible mitigation option after solar energy in the near term. Furthermore, forest-based adaptation, including sustainable forest management, forest conservation and restoration, reforestation and afforestation, were held as highly feasible adaptation options, having high synergies with mitigation. While the specific employment effects of the forest-based adaptation and mitigation options depend on context, they can provide new work opportunities in forest restoration and conservation, tree planting, plantation establishment and forest management (IPCC, 2023).

Forests are also increasingly affected by climate-change related disturbances like storms, droughts and fires, increasing incidence of pests and diseases and accelerated introduction and spread of invasive species. The risk of disturbances can be mitigated by specific management interventions. In addition, supporting the adaptation of forests to a changing climate can be facilitated by assisted migration, where species or provenances that are better adapted to the anticipated future conditions are introduced from other regions (Kübler and Günter, forthcoming). However, assisted migration is a contested management strategy that also involves risks and trade-offs (Hewitt *et al.*, 2011).

Most of global terrestrial biodiversity is found in forests. This emphasizes the role of forest protection, sustainable forest management and restoration of degraded areas for protecting and enhancing forest biodiversity. It will also induce changes in forest management. These developments will influence the number and nature of forest-related employment. The Kunming-Montreal Global Biodiversity Framework adopted at the 15th Conference of Parties to the United Nations Convention on Biological Diversity includes targets to conserve 30 percent of land area, restore 30 percent of degraded ecosystems and halve the introduction of invasive species (CBD, 2022).

1.3.6 Green economy, forests and employment

The dominant development model has mainly focused on continuous economic growth and has been based on increasing use of natural resources and fossil fuels, with often detrimental changes in ecosystems and the global biophysical balance, now manifested in pollution, climate change and accelerated loss of biodiversity. The prevailing development model has not been able to address the interlinked social, environmental and ecological challenges discussed above. There is increasing recognition of the need to move towards more sustainable production and consumption and to address social inequalities. Green economy is a policy agenda and strategy towards economic development that is ecologically sustainable, in other words, keeping within the planetary boundaries, and socially just and equitable. It emphasizes the importance of replacing fossil fuels and raw materials with renewable ones. A just transition to a green economy is important for sustaining employment in natural resource based sectors and ensuring the focus on decent work. Greening the economy in a fair and inclusive way and increasing decent employment through NbS are also expected to have a positive effect on economic growth and could potentially create millions of additional jobs (ILO, UNEP and IUCN, 2022).

In the forest sector, as for any sector, a just transition is not possible unless new skills are provided. Upskilling and reskilling workers for greener and more sustainable activities and new technologies is essential to guarantee the long-term sustainability and substitution of business-as-usual activities. Skills development, combined with sound social security and social protection policies, can support the transition of workers from high-emission jobs and provide livelihood security. “Nature-based solutions (NbS)”, “green jobs” and “bioeconomy” are terms that are being more widely used and implemented as strategies towards a green economy. NbS have emerged as a central concept towards reaching the goals of global environmental agreements (Convention on Biological Diversity, United Nations Framework

Convention on Climate Change, United Nations Convention to Combat Desertification) and the Sustainable Development Goals (SDGs). They include activities that benefit people and nature through protection, sustainable management and restoration of ecosystems. Green jobs is also a term gaining momentum within strategies towards the green economy. It is important to note that green jobs refers to employment that contributes to preserving, restoring and enhancing environmental quality while also meeting the requirements of decent work. Creating and supporting the development of green jobs is crucial for moving towards the green economy (ILO, UNEP and IUCN, 2022). Bioeconomy supports the decoupling of economic activities from the increasing use of natural resources and includes sustainable production, utilization, conservation, and regeneration of biological resources. Circularity is an important element of sustainable bioeconomy. It concentrates on minimizing waste and returning all kinds of waste back to the economy as long as possible through increasing resource use efficiency, creating by-products, and through re-using and adding value to waste (FAO, 2023). Forest-sector value chains offer good potential for developing circular economy, but its advancement is curtailed by the traditional mindsets and means of operation in the sector (FAO and UNECE, 2021). The future of forests, the forest sector and forest-sector employment are importantly shaped by political and socioeconomic changes mentioned above and efforts to address the pressing environmental challenges of climate change, environmental degradation and subsequent biodiversity loss. Increasing appreciation of the critical role of forests and the forest sector in addressing these challenges and their central role in the transition towards a green economy and increasing utilization of NbS induces important changes in labour markets, including changes in employment in different sectors and skills required, but holds considerable potential to create new employment opportunities (ILO, UNEP and IUCN, 2022). In this context, “promoting the generation of green jobs for rural youth in the forest sector can provide a strong solution for rural development and environment sustainability” (Fagan *et al.*, 2023).

On the other hand, recent global and regional agreements have included important goals for protecting and supporting biodiversity by ensuring that at least 30 percent of terrestrial areas of particular importance for biodiversity and ecosystem functions and services are effectively conserved and managed within protected areas by 2030 (CBD, 2022; EU, 2021). These agreements and other international initiatives, such as the Bonn Challenge³ and related national commitments, also include large area targets for restoring degraded forest areas and their sustainable management. Increasing demands for forest protection can limit traditional economic uses of forests based on the utilization of wood, and thus reduce forest employment in traditional forest activities, but it can create new employment opportunities that relate to culture, recreation and tourism.

³ Bonn Challenge: <https://www.bonnchallenge.org/about>

2. Current forest-sector employment and employment issues in national strategies and policies

2.1 Forest-sector employment globally and in different regions: A brief overview

According to the International Standard Industrial Classification, the forest sector encompasses three main subsectors: forestry and logging (forestry), the manufacture of wood and wood products (the wood industry), and manufacture of paper and paper products (the paper industry). Nature (forest)-based tourism is not included in the forest sector. The forestry and logging subsector includes silviculture, activities related to production of goods derived from forests such as raw wood-producing activities, the extraction and gathering of NWFPs, and fuelwood and charcoal. The wood industry covers the manufacturing of semi-finished wood and products of wood. The paper industry refers to the manufacture of pulp, paper and converted paper products (UN Department of Economic and Social Affairs, 2008).

An estimated 1 percent of the entire global workforce, at least 33 million people, was employed by the forest sector in 2017–2019 (data covers 185 countries, representing 99 percent of global forest area). This is 15 percent less than in 2011–2013 (Lippe *et al.*, 2022). This drop reflects the commonly observed decline in agriculture and manufacturing sector employment in middle- and high-income countries that has resulted from structural changes within economic sectors leading to the increasing importance of service sectors (ILO, 2019a). Table 1 presents the estimated number of persons employed in the forest sector in total and in International Standard Industrial Classification subsectors by region for two periods, 2011–2013 and 2017–2019.



TABLE 1 Estimated number of persons employed in the forest sector and subsectors by region for the periods 2011–2013 (a) and 2017–2019 (b). Includes formal and informal employment and subsistence activities

(a) 2011–2013

Region	Forestry and logging		Wood and wood product manufacture		Pulp and paper manufacture		Total
	1 000 persons employed	% of total forest-sector employment in the region	1 000 persons employed	% of total forest-sector employment in the region	1 000 persons employed	% of total forest-sector employment in the region	1 000 persons employed
Africa	1 928.3	46.9	1 866.2	45.4	316.9	7.7	4 111.4
Americas	819.5	28.2	1 445.0	49.8	637.2	22.0	2 901.7
Asia	5 924.0	20.5	18 145.0	62.8	4 828.7	16.7	28 897.7
Europe	872.2	25.5	1 670.7	48.8	882.1	25.7	3 425.0
Oceania	64.6	39.1	73.4	44.5	27.1	16.4	165.1
Global	9 608.6	24.3	23 200.3	58.3	6 692.0	16.9	39 500.9

(b) 2017–2019

Region	Forestry and logging		Wood and wood product manufacture		Pulp and paper manufacture		Total
	1 000 persons employed	% of total forest-sector employment in the region	1 000 persons employed	% of total forest-sector employment in the region	1 000 persons employed	% of total forest-sector employment in the region	1 000 persons employed
Africa	1 972.7	41.5	2 361.4	49.7	418.2	8.8	4 752.3
Americas	842.1	29.8	1 291.7	45.7	689.4	24.4	2 823.2
Asia	4 199.7	19.0	14 104.1	63.9	3 759.5	17.0	22 063.3
Europe	965.3	27.7	1 557.9	44.7	961.6	27.6	3 484.8
Oceania	77.7	41.3	85.2	45.3	25.2	13.4	188.1
Global	8 057.5	24.2	19 400.3	58.2	5 853.9	17.6	33 311.7

Data source: Both tables, Lippe, R.S., Schweinle, J., Cui, S., Gurbuzer, Y., Katajamäki, W., Villarreal-Fuentes, M. & Walter, S. 2022. Contribution of the forest sector to total employment in national economies. Estimating the number of people employed in the forest sector. Rome and Geneva, FAO and ILO. <https://doi.org/10.4060/cc2438en>.

The estimated global decline in forest-sector employment hides differences between regions and subsectors. Total forest-sector employment increased from 2011–2013 to 2017–2019 in Africa, and also slightly in Europe and Oceania, while it declined in the Americas and Asia. Globally, the relative share of employment in the different subsectors remained almost the same across the two periods.

Of the subsectors, wood and wood product manufacturing provides the most forest-sector employment across regions (58.2 percent in 2017–2019), followed by forestry and logging (24.2 percent in 2017–2019). Pulp and paper manufacturing is the lowest share (17.6 percent in 2017–2019). Except in Oceania, the relative share of pulp and paper manufacturing subsector employment increased across regions. Forestry and logging provide over 40 percent of forest-sector employment in Africa and Oceania. In these regions, the pulp and paper manufacturing subsector share of employment was lowest but has slightly increased between the data periods (Lippe *et al.*, 2022).

A large share of forest-sector employment is informal, for which data do not exist or is very partial and unreliable, all of which makes estimation of total employment in the sector difficult. Based on the information from 56 countries, informal employment accounted in general for 70 percent of total forest-related employment. Where data were available in African and Asian countries, informal employment

accounted for over 80 percent of total forest-related employment (Lippe *et al.*, 2022). Most subsistence workers and informal jobs are in logging, charcoal production, fuelwood and NWFP collection. Women are more likely to have informal jobs than men. The most common informal activity for women is fuelwood collection (Lippe *et al.*, 2022). Informal work is persistent in the forest sector and its share of total employment does not decrease with economic growth. The main causes for the pervasively high share of informal jobs in forestry are poverty, lack of education and migration (Cui, Lippe and Schweinle, 2022). While global data on women's employment in the forest sector are not available, in the 69 countries for which International Labour Organization (ILO) employment microdata were available for at least one subsector for 2017–2019, the share of women was 23 percent of total forest-related employment (Lippe *et al.*, 2022). Information on the forestry employment of youth in low- and middle-income countries is also scarce. As an example, in Canada, of the employees in the forestry and logging industry (companies engaged in growing and harvesting timber), 10 percent were between 15 and 24 years of age in 2021 (Province of British Columbia, 2023).

2.2 Employment issues in national strategies and policies

The global level employment-related goals are expressed in the SDGs agreed upon in 2015. SDG 8 calls for “full and productive employment and decent work for all” (UN, 2015). SDG 8 is framed within the promotion of “sustained, inclusive and sustainable economic growth”, indicating the central role of economic growth and economic policies for creating and sustaining employment. However, economic growth alone is not sufficient to generate sustainable and productive employment. With the exception of some countries, the forest sector's direct contribution to national gross domestic product (GDP) has generally been low compared with other economic sectors. The direct contribution of the forest sector to global GDP was estimated at USD 539 billion in 2011. But when including indirect and induced impacts it totalled over USD 1 298 billion (Li, Mei and Linhares-Juvenal, 2019). This was less than 2 percent of global GDP in 2011. However, the role of forest-related economic activities and employment is especially important in rural areas in lower income countries with large rural populations and limited employment opportunities.

One of the main objectives in national employment policies is to convert economic growth into employment growth. Employment policies cut across macroeconomic and microeconomic dimensions and address a wide range of issues related to labour demand and labour supply. Employment policies are a part of macroeconomic policies, trade policies, industrial policies and labour market policies. In general, employment issues feature importantly in national development plans and strategies and are often connected with the provision of social services and poverty reduction. For example, improving “the living conditions of the population and their access to basic social services by ensuring a significant reduction in poverty and underemployment” is one of the main objectives of the National Development Strategy 2020–2030 of Cameroon (Republic of Cameroon, 2020, p. 4). Employment generation and extension of social protection are also important elements in the national development strategies of Honduras (Visión de País 2010–2038 y Plan de Nación 2010–2022) and the premises of the National Development Plan of South Africa 2020–2030 include “economic growth and higher investment and employment” and “rising standards of education, a healthy population and effective social protection” (Republic of South Africa, 2011, p. 2). Macroeconomic policies for promoting a just transition towards a green economy have also included plans for stimulating investment and supporting development in sectors with potential for providing green jobs (van der Ree, 2017).

Some national development strategies include explicit forest-sector development priorities. The goals of the National Development Strategy 2020–2030 of Cameroon focus on industrialization and economic growth, reduction of underemployment and increasing access to basic social services, climate change mitigation and adaptation and environmental management for sustainable and inclusive economic growth and social development, and improvement of governance. For developing the forest and wood sector, the strategy focuses on planting forest plantations and strengthening the wood processing industry, including manufacture of furniture, and use of wood for construction and industrial uses (Republic of Cameroon, 2020).



In addition to national development or more specific national employment strategies and policies, employment concerns are also often included in sectoral development policies and programmes such as forest and agricultural policies, climate change and energy policies, which focus on the challenges and opportunities within the specific sector. For example, the vision statement of the Forestry Sector Strategy 2016–2025 of Nepal calls for a competitive and well-governed forestry sector providing equitable employment, incomes and livelihood opportunities. One of the key thematic areas focuses on promoting enterprise and economic development for harnessing the potential of forests for employment and economic growth (Government of Nepal, 2016).

Furthermore, many countries are developing national forest or forest landscape restoration strategies and plans for guiding the implementation of their ambitious restoration targets (Chazdon *et al.*, 2017). Some countries have adopted more specific strategies for plantation development. The Ghana Forest Plantation Strategy 2016–2040, for example, aims at increasing the supply of goods and services from planted forests and creating environmental, economic and social benefits including employment opportunities and sustainable

livelihoods for rural communities. It supports the establishment and management of 625 000 ha of forest plantations, enrichment planting of 100 000 ha in degraded forests and planting trees on agricultural lands covering 3.75 million ha. The strategy supports cultivation of food crops during the establishment of forest plantations (Taungya System) and understorey planting of spices and medicinal plants, and alternative livelihood activities such as apiculture. The strategy is projected to provide 3 039 500 jobs over the 25-year period (Forestry Commission, Ghana, 2016).

Traditionally most restoration efforts in the past have been undertaken with government resources or were supported by international development funding. However, in countries where the investment environment facilitates and supports private investment there is a trend towards increasing involvement of the private sector in restoration efforts as impact investors or in public–private partnerships. This is the case in Central America and Mexico, where economic incentive programmes are in place to attract companies and private impact investors (Sabogal *et al.*, forthcoming).

Public environmental programmes often include social objectives and can provide employment and incomes. As an example, the Guatemalan government's Probosque programme, the main instrument to support restoration, incentivizes rural landholders, including local and Indigenous communities, to plant trees for restoring/reforesting their land, establish plantations or agroforestry systems or conserve existing forest by yearly payments for 5 to 10 years depending on the activities (Instituto Nacional de Bosques, n.d.).

Employment of youth and women has received increasing attention in public policies. Many countries, including at least 15 African countries, have developed specific youth employment policies and plans (ILO Employment Policy Gateway).⁴ In Uganda an assessment of the forest value chain revealed that while Uganda's legal and policy frameworks stress youth employment, they seldom focus on decent work issues (Ssanyu and Mubiru, 2021). In Ghana, the Youth in Afforestation Programme launched in 2016 aims at planting about 10 million trees and providing jobs for 65 000 youths. However, due to financial, logistical and political challenges these aims have not been reached (Nketia *et al.*, 2022). Furthermore, the African Union's Ouagadougou Declaration has established a regional framework for promoting the employment of women and youth in African Union member states (AU Commission, 2015).

⁴ ILO Employment Gateway: <https://www.ilo.org/empgateway/#publications>

3. Decent work and related challenges in the forest sector

3.1 The definition of decent work and decent work indicators

The concept of decent work was adopted as the primary goal for the International Labour Organization (ILO) in 1999. According to ILO (1999), decent work:

...involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for all, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men.

Decent work is considered an integral element of basic human rights and sustainable development and has accordingly been included in the Universal Declaration of Human Rights and in the United Nation's 2030 Agenda for Sustainable Development and the related SDGs.

The concept of decent work is multidimensional and combines four interlinked main themes, which form the pillars of the ILO's Decent Work Agenda: employment creation, social protection, rights at work, and social dialogue. In general, work can be considered decent when it pays a fair income, guarantees a secure employment and safe working conditions, ensures equal opportunities and treatment for all, includes social protection for the workers and their families, offers prospects for personal development, encourages social integration and allows workers to freely express their concerns and to organize (ILO, 1999).

Decent work is a crucial element of sustainable development, and in the 2030 Agenda it is specifically addressed in SDG 8: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (UN, 2015). The formulation of SDG 8 and the indicators for following the progress in the specific targets align with the ILO framework for measuring decent work (see Box 1) (Stoian, Monterroso and Current, 2019). In relation to decent work, the specific SDG 8 targets are:

- Target 8.3: ... promotion of development-oriented policies that support productive activities [and] decent job creation ...;
- Target 8.5: ... achievement of full and productive employment and decent work for all women and men, including young people and persons with disability, and equal pay for work of equal value;
- Target 8.7: ... eradication of forced labour, modern slavery and human trafficking; prohibition and elimination of the worst forms of child labour in all its forms; and
- Target 8.8: ... protection of labour rights and promotion of safe and secure working environments for all workers ... women and those in precarious employment (UN, 2015).

Decent work is also crucially linked with other aspects of sustainable development and related SDGs. Increasing decent employment opportunities in forestry and forest-based value chains will provide income, encourage safer and more stable working conditions and improve productivity, which can further support poverty reduction and improve food and nutritional security, promote health and reduce inequalities (Estruch and Rapone, 2013; Stoian, Monterroso and Current, 2019).



BOX 1 – International Labour Organization (ILO) decent work indicators

For assessing and monitoring progress towards decent work, ILO has developed a system of indicators. The decent work indicators were first adopted in 2008. Further improved and supplemented indicators were adopted in 2013 to provide a method to analyse and assess the different dimensions of decent work in various countries. They cover the different elements of the Decent Work Agenda. At national level the existence and effective implementation of labour legislation, based on international labour standards, is a cornerstone for advancing decent work.

The ILO (2013a) decent work indicators and the corresponding legal framework indicators (in italics) are:

- Employment opportunities (*Government commitment to full employment, Unemployment insurance*);
- Adequate earnings and productive work (*Statutory minimum wage*);
- Decent working time (*Maximum hours of work, Paid annual leave*);
- Combining work, family and personal life (*Maternity leave, Parental leave*);
- Work that should be abolished (*Child labour, Forced labour*);
- Stability and security of work (*Termination of employment*);
- Equal opportunity and treatment in employment (*Equal opportunity and treatment, Equal remuneration of men and women for work of equal value*);
- Safe work environment (*Employment injury benefits, Occupational safety and health labour inspection*);
- Social security (*Old-age social security or pension benefits, Incapacity for work due to sickness/sick leave, Incapacity for work due to invalidity*);
- Social dialogue, workers' and employers' representation (*Freedom of association and the right to organize, Collective bargaining right, Tripartite consultations*); and
- Economic and social context for decent work (*Labour administration*).

Source: See References.



3.2 International labour standards

International labour standards have been developed to address specific issues of international concern. Overall, there are currently 190 ILO conventions and 206 recommendations addressing specific labour and decent work issues. While there is no specific ILO convention on forestry, many of its conventions and recommendations, as well as the fundamental principles and rights at work, apply to the forest sector (ILO, 2019c). The fundamental conventions apply to all workers regardless of the status of ratification the conventions, while other conventions become legally binding once ratified by member states. Recommendations cannot be ratified and do not have legal requirements.

In the Declaration on Fundamental Principles and Rights at Work (ILO, 1998a, 2022c), all ILO member states have agreed to promote and apply the principles and rights at work including the effective abolition of child labour, the elimination of all forms of forced or compulsory labour, the elimination of discrimination in respect of employment and occupation, freedom of association and the effective recognition of the right to collective bargaining, and a safe and healthy working environment. In addition to this declaration, the ILO member states should enact and enforce national legislation that protects workers in the forest sector (ILO, 2019c). In 2022, the International Labour Conference adopted a resolution to add the principle of a safe and healthy working environment to the ILO's Declaration on Fundamental Principles and Rights at Work (ILO, 2022c).

Table 2 includes ten fundamental conventions and the corresponding ratification status of ten countries with the largest forest area around the globe (Stoian, Monterroso and Current, 2019). All member countries should respect the fundamental conventions, with or without ratification. Stoian, Monterroso and Current (2019) remind that effective enforcement mechanisms are needed to implement the conventions.

TABLE 2 The countries with the largest forest areas (columns) and their status related to the International Labour Organization (ILO) eight fundamental conventions (rows). Y/green colour = the convention is ratified, N/grey colour = not ratified

ILO convention (number)	Australia	Brazil	Canada	China	DR of the Congo	India	Indonesia	Peru	Russian Federation	United States of America
Forced Labour Convention, 1930 (No. 29)	Y	Y	Y	N	Y	Y	Y	Y	Y	N
Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87)	Y	N	Y	N	Y	N	Y	Y	Y	N
Right to Organize and Collective Bargaining Convention, 1949 (No. 98)	Y	Y	Y	N	Y	N	Y	Y	Y	N
Equal Remuneration Convention, 1957 (No. 100)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Abolition of Forced Labour Convention, 1957 (No. 105)	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Minimum Age Convention, 1973 (No. 138)	N	Y	Y	Y	Y	Y	Y	Y	Y	N
Worst Forms of Child Labour Convention, 1999 (No. 182)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Source: Stoian, D., Monterroso, I. & Current, D. 2019. Decent work and economic growth – potential impacts on forests and forest-dependent livelihoods. Chapter 8. In: P. Katila, C.J. Pierce Colfer, W. de Jong, G. Galloway, P. Pacheco & G. Winkel, eds. *Sustainable Development Goals: Their impacts on forests and people*. Cambridge, Cambridge University Press.

ILO has also developed two specific tools for enhancing decent work in the forest sector (ILO, 2019a). The first one is the *Guidelines for labour inspection in forestry* (ILO, 2005), which provides guidance to labour inspectors in the sector, from planting to logging, and contains main principles of the labour standards. The second tool is the ILO code of practice *Safety and health in forestry work* (ILO, 1998b), which focuses on the prevention of occupational injuries and illnesses.

Forest-sector enterprises of all sizes have a fundamental role in advancing decent work, and human and labour rights should be considered in all activities and phases of business operations (see Box 2). In addition, enterprises should comply with national legislation and regulations. The crucial principles for business are included in the ILO Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy (MNE Declaration) (ILO, 2017a) and the United Nations Guiding Principles on Business and Human Rights (UN, 2011a; UN, 2011b). These principles enhance socially sustainable globalization and respect for human rights, and prevent negative impacts of businesses (UN, 2011a; UN, 2011b).

Furthermore, two voluntary and widely adopted forest certification schemes cover socially responsible forest management: the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). These certification schemes include elements referring to fundamental principles and rights at work, the ILO code of practice *Safety and health in forestry work* and the ILO *Guidelines for labour inspection in forestry* (ILO, 2019c).

The ILO Indigenous and Tribal Peoples Convention, 1989 (No. 169) covers the rights of Indigenous and tribal peoples in relation to their land, resources and traditional livelihoods, including the forest sector. It requires governments to consult with the communities of Indigenous and tribal peoples and obtain their free, prior and informed consent before making decisions that may affect them. The superseded Indigenous and Tribal Populations Convention, 1957 (No. 107) is still relevant for countries that have not ratified Convention No. 169. It covers similar rights for Indigenous and tribal peoples in relation to their land, resources and traditional livelihoods (ILO, 2013b).



BOX 2 – Decent work indicators: Uganda case study

In the case of Uganda, Ssanyu and Mubiru (2021) have adopted and modified the indicators based on the International Labour Organization (ILO) framework and the Decent Work Agenda. The authors described that their list of indicators also covers dimensions of Sustainable Development Goal (SDG) 8. The decent work indicators and the corresponding statistical indicators are listed below. In Uganda, one of the main challenges for decent rural employment is the lack of skills among both employers and workers. The extra costs of improving work conditions towards decent work hinder the adoption of related measures. The country is facing a high unemployment rate and workers concentrate on keeping their jobs. This situation increases the vulnerability of workers and allows employers to neglect decent work principles. The lack of knowledge and resources, including financial, among entrepreneurs is prevalent in other countries as well, especially in relation to small and medium size forest enterprises (SMFEs).

Element of decent work	Statistical indicators
Employment opportunities	• rate of informal employment • labour force participation rate • employment by status in employment • proportion of self-employed and contributing family workers • incidence of migrant and seasonal/casual employment • share of wage employment • labour underutilization • time-related unemployment rate
Adequate earnings and productive work	• working poverty rate • average hourly/daily/monthly earnings • average real wages • statutory minimum wage • employees with recent job training
Decent working time	• excessive working time • usual hours worked • annual hours worked • time-related underemployment rate • paid annual leave
Combining work, family and personal life	• unusual hours • maternity protection • earnings for contributing family work
Work that should be abolished	• child labour in all forms • hazardous work • forced labour
Stability and security of work	• employment contracts • precarious employment rate • job tenure • subsistence worker rate • real earnings casual workers
Equal opportunity and treatment in employment	• occupational segregation by sex • share of women in management • gender wage gap • share of women in wage employment • non-discrimination at work • persons with disabilities in employment
Safe work environment	• occupational injury rate, fatal • occupational injury rate, non-fatal • time lost due to occupational injuries • labour inspection
Social security	• health care expenditure not financed out of pocket by workers • share of workers contributing to a pension scheme • sick leave • incapacity and invalidity benefits
Social dialogue, workers' and employers' representation	• union density rate • enterprises subscribed to employer organization • collective bargaining coverage rate • days not worked due to strikes

Source: See References.

3.3 Challenges of decent work in the forest sector

The forest sector has numerous decent work challenges. These include low wages and productivity, wide informality, seasonality, gender inequality (forest work carried out by women is often informal, low-paid or unpaid and they have less control over forest resources), low unionization rate and obstacles to the right to freedom of association and collective bargaining, lack of job security and access to social protection, and dangerous work including poor and unsafe working conditions with risks of occupational injuries and health problems (Campos Arce, 2019; FAO, ILO and United Nations, 2023; ILO, 2019a, 2019b). Illegal forest activities, such as illegal logging, are common in many locations and related jobs are out of reach for the efforts to advance decent work. During the past decades, outsourcing, contracting and subcontracting of work tasks and self-employment have increased in the forest sector, further exacerbating decent work challenges (Campos Arce, 2019; ILO, 2019a).

Forest work is also often physically demanding, involves a high risk of work accidents and predisposes for severe health problems (Campos Arce, 2019; FAO, ILO and United Nations, 2023). The main occupational safety and health risks of forest work relate to numerous issues (ILO, 2005, 2019a):

- climate change has increased health risks related to extreme conditions like cold, heat, heavy rain, storms, floods, forest fires and vector-borne diseases;
- work is often in difficult terrain;
- work is often isolated;
- work is often done with machinery, exposing workers to vibration, noise, exhaust fumes and sedentary work;
- work exposes employees to the danger of falling trees; and
- work may involve exposures to chemical and biological substances.

Decent work challenges in the forest sector are intrinsically related to the persistence of informal work. Informal employment is widespread, and worldwide it is the predominant form of employment within the forest sector (Cui, Lippe and Schweinle, 2022). In the study by Lippe *et al.* (2022), estimates based on 56 countries in 2017–2019 reveal that about 77 percent of the total forest-related employment in those countries was informal. The share of informal employment is high, especially in the lower income countries (e.g. in Uganda 98 percent, according to Lippe *et al.*, 2022), but it is also present in emerging economies and higher income countries. The main contributing factors and causes behind persistent informal work are poverty, lack of education and migration. Push factors for informality is poverty and pull factors are labour market dynamics. Informal workers are especially vulnerable to all decent work deficits and lack all social protection (Cui, Lippe and Schweinle, 2022). Informal work is prevalent in small and medium size forest enterprises (SMFEs), which provide most forest-sector employment globally (Cui, Lippe and Schweinle, 2022).

Informality and other decent work challenges are especially severe for women and migrant workers. Globally, women carry out many forest activities, but often their role is informal, low paid or even unpaid. In lower income countries especially, rural women often collect and use forest resources, for example the collection of wood for cooking and heat. It is estimated that globally, approximately a quarter of all forest workers are women. As a minority, they are often not involved in decision-making processes, and lack education and training opportunities. In addition, in many cases they do not have secure rights to forest land and resources (Caswell, 2018; ILO, 2019a).

Manual, physically demanding, seasonal and labour-intensive work tasks, often in poor working conditions, are in many cases done by migrant workers. Planting, cutting, weeding, collecting and selling fuelwood or charcoal are typical work functions done by migrant workers. Often their work is done without any contracts. They may also have problems related to local language, work is isolated, they face lack of protection (ILO, 2019a) and are discriminated against and lack basic human rights (Macqueen and Campbell, 2020).

While the global population is aging in many parts of the world, population growth in others is increasing the young, working age population. Providing decent work for them is an important challenge, especially in sub-Saharan Africa. Youth (ages 15–24) make up about 16 percent of the global population, but their share of the world's unemployed is 50 percent. Unemployment is common, especially in rural areas and among young women (Macqueen and Campbell, 2020).

4. Employment opportunities and challenges

4.1 Forestry, restoration and agroforestry

4.1.1 Current importance and potential

Several of the trends discussed in Chapter 1 have resulted in a considerable increase in the demand for wood and consequently an increased pressure for wood harvesting. At the same time, some of the global trends are increasing pressure to protect forests from extractive uses and instead concentrate on sustaining and increasing forest biodiversity, carbon sequestration and storage, and recreational and landscape values.

According to FAO (2020), 73 percent of the world's forests are publicly owned. About a third of the world's forests are designated for production (FAO, 2020), and a large share of the publicly owned production forests are under logging and/or management concessions, although reliable global data on the extent of these concessions is not available. According to one estimate, forest concessions cover about 14 percent (123 million ha) of the publicly owned forest in Latin America, Southeast Asia and Western and Central Africa, and generally provide about one job per 100–500 ha, but can also support local communities by providing education, medical care, and/or by improving water supply or transport infrastructure (van Hensbergen, 2016). Furthermore, according to Linhares-Juvenal *et al.* (n.d.), of the 410 million ha of production forest (45 percent of natural forests) in Latin America, 18.5 million ha are under industry or community concessions. In Guatemala, the Maya Biosphere reserve community concession of 0.5 million ha has provided 30 000 seasonal jobs. In Peru where most forests are state owned and leased as concessions (Salo, Helle and Toivonen, 2011; Salo *et al.*, 2023), 8.9 million ha granted to small- or medium-size timber producers or large-scale companies has created 12 000–16 000 jobs (Linhares-Juvenal *et al.*, n.d.). As these examples indicate, logging can provide important job opportunities in rural areas. However, unsustainable harvesting and lack of sustainable management of logged areas are serious problems in concession areas (Linhares-Juvenal *et al.*, n.d.).



The unprecedented commitments towards restoring deforested and degraded forest areas made under the global initiatives and the related regional initiatives (Box 3) combine forest protection and conservation goals. Furthermore, the United Nations declared 2021–2030 the UN Decade on Ecosystem Restoration. Under these initiatives national governments, as well as corporate and civil society actors, have committed to restore millions of hectares of deforested and degraded lands.



BOX 3 – International restoration initiatives

The goal of the Bonn Challenge is to restore 150 million ha of degraded and deforested landscapes by 2020 and 350 million ha by 2030. This goal was endorsed by the New York Declaration on Forests (2014), a political declaration that complements the Bonn Challenge. These commitments are further supported by regional initiatives:

- The African Forest Landscape Restoration Initiative (AFR100) aims to bring 100 million ha of land to restoration by 2030.
- The Initiative 20x20 seeks to change the dynamics of land degradation in Latin America and the Caribbean by beginning to protect and restore 50 million ha of forests, farms, pasture and other landscapes by 2030.
- ECCA30 (named for the initials of its focus regions) in **E**urope, the **C**aucasus and **C**entral **A**sia, aims to bring 30 million ha of degraded and deforested land into restoration by 2030.
- The Agadir Commitments by 10 Mediterranean countries aims to restore 8 million ha of degraded land by 2030.

Sources: <https://www.bonnchallenge.org/about>, <https://forestdeclaration.org/about/new-york-declaration-on-forests/>, <https://initiative20x20.org/>

Forest restoration is undertaken for achieving different goals and it includes different understandings and approaches. The main goals can include carbon sequestration, restoring biodiversity, timber production, water regulation, improving the livelihoods of local communities and smallholders, or combinations of these and other goals. The goals and the desired outcomes are shaped by the biophysical and climate conditions and the state of the land, past land use, the social and cultural context, and the prevailing governance arrangements. The different restoration approaches vary considerably in terms of labour and other inputs ranging from natural regeneration (i.e. ending activities that have caused degradation and protecting the site) to more input-intensive approaches that can include seeding or planting and establishing plantations, and to even more resource-intensive approaches like agroforestry and silvopastoral systems that combine trees with agricultural crops or livestock. Furthermore, forest and landscape restoration has in recent decades emerged as an important approach towards restoring degraded landscapes. It refers to a (Besseau, Graham and Christophersen, 2018, p. 18):

... process that aims to regain ecological functionality and enhance human well-being in deforested and/or degraded landscapes ... [It is] a means of regaining, improving, and maintaining vital ecological and social functions, in the long-term leading to more resilient and sustainable landscapes.

From the point of view of employment and decent work, forest restoration work consists of similar work and tasks as sustainable forest management in general, including seeding, planting, silvicultural treatments and wood harvesting/logging, as well as work related to the assessment of the condition of the site and monitoring its rehabilitation. Technological development and digitalization are inducing important changes in forest management, including forest assessment and monitoring, harvesting and post harvesting work as well as in forest-based value chain development. These changes will affect all forest management tasks as well as the planning and use of forests regardless of the objectives of forest management and restoration.

There are important differences between the roles of women and men in forest activities and forest and tree-based value chains. These are critically reflected in the benefits women receive from forest and tree-based activities (Box 4).



BOX 4 – Women in forest, tree and agroforestry (FTA) value chains

A systematic literature review on gender and FTA value chains found that women were more involved as harvesters, processors and traders, but that there were considerable regional differences depending on the region and product in question. Overall, women's roles relate more to products that generate lower average revenues and small-scale retail trade, while men dominate the larger operations that generate higher revenues and control more valuable products. The gender differences are strongly influenced by FTA value chain governance, which includes cultural norms and customs; ownership and access to resources; and access to technology, credit and markets. Other social factors like education, marital status, age and ethnicity also shaped women's roles. Women's right to forest and forest and tree products are often weaker, less secure, more unclear and less enforced than men's (Ingram *et al.*, 2016).

The review also inspected reported FTA value chain interventions, which mainly focused on increasing women's participation at different stages of the value chain and increasing their benefits involving improved technology and marketing. It concluded that interventions that combined horizontal (organizing women's groups, mixed-gender groups and cooperatives) and vertical coordination (coordination between women/groups with buyers and service providers) were most successful (Ingram *et al.*, 2016).

Source: See References.

Woodfuels will continue to be an important source of energy for the growing population and create considerable employment. A third of the global population relied on traditional woodfuels for cooking in 2019, most of them in southern Asia and sub-Saharan Africa. Traditional woodfuels are also widely used by small enterprises. While access to clean cooking fuels and technologies has increased in Asian countries, most sub-Saharan countries are lagging behind mainly because of rapid population growth (FAO, 2022a; IEA, 2021). In seven sub-Saharan African countries (the Democratic Republic of the Congo, Ethiopia, Madagascar, Mozambique, the Niger, Uganda and the United Republic of Tanzania), 5 percent or less of the population have access to clean cooking fuels and technologies (IEA, 2021). In 2020, global woodfuel consumption totalled 1.9 billion m³. The trajectories for its increase by 2050 vary greatly, from 2.1 billion m³ to 2.7 billion m³. Most of this will continue to come from natural forests and woodlands but establishing woodlots and expanding agroforestry as part of forest landscape restoration efforts can increase the availability of wood for energy (FAO, 2022c). Fuelwood collection for subsistence and sale and charcoal value chains create employment for a large number of people, especially in sub-Saharan Africa. Woodfuels provide 88 percent of total energy use in Uganda (MWE and WB, 2019) and about 70 percent of domestic energy need in Kenya (Ndegwa *et al.*, 2020). In Kenya, charcoal production, trade and transport provided employment for about half a million people in 2000 (Ndegwa *et al.*, 2021). In Malawi, the charcoal value chain is estimated to support the livelihoods of 100 000 people (Kambewa *et al.*, 2007). Based on existing country information, Mwampamba *et al.* (2013) extrapolated that in 2013 the charcoal industry provided income and livelihoods for up to 7 million people in sub-Saharan Africa.

In many African (e.g. Ghana, Kenya and Malawi) and Asian countries (e.g. India and the Lao People's Democratic Republic), the collection of fuelwood is a task for women and children, especially girls, and can involve covering long distances and taking a considerable amount of time. This limits women's participation in other economic activities and leads to children missing education. However, in some countries men also participate or spend more time than women in collecting fuelwood (e.g. Madagascar and Nicaragua) (UN DESA, 2010). There is also evidence of women's increasing participation in charcoal value chains, especially in retail (Ihalainen, Schure and Sola, 2020).

Substituting for fossil fuels increases pressures for forest biomass harvesting. Within the European Union, forest biomass accounts for one-fifth of bioenergy production. By-products of the wood processing industry and post-consumer recovered wood cover about 49 percent of the European Union's wood energy use (Camia *et al.*, 2021). The European Union and the United States of America have promoted the use of wood biomass for reaching their renewable energy targets (Page-Dumroese *et al.*, 2022).

The EU Renewable Energy Directive (RED 2018/2001/EU) set the binding target of at least 32 percent renewable energy by 2030. This target was further increased to 45 percent by 2030 as part of the plan to reduce the European Union's dependence on Russian Federation fossil fuels (RED III, EC, 2022). The latest provisional agreement raises the target to a minimum of 42.5 percent but reiterated the overall aim to reach 45 percent of renewables by 2030.⁵

Increasing demands for regulating and cultural services can also provide new employment. Forests have a crucial role in climate change mitigation (see Box 5), water provision and quality, for soil stabilization and as a habitat for biodiversity. Increasing the provision of these services leads to changes in forest management practices and increases the need for forest protection. The ambitious global targets to restore millions of hectares of deforested and degraded forests reflect increasing demands for wood as well as the need to ensure environmental and cultural functions of forests.



BOX 5 – Indigenous Peoples – agents of climate change through decent work

Indigenous Peoples, totaling 476.6 million people, face several threats regarding advancing climate change because they live in regions that are the most vulnerable to negative conditions. Most live in Asia and the Pacific area, which is assessed as especially vulnerable to variable climatic effects like rising sea level, storms and floods (ILO, 2019d). Their livelihoods depend on natural resources, including forests, and they care for most (up to 80 percent) of the Earth's biodiversity, even though their share of global population is only 5 percent. Poverty, migration and gender inequality are also characteristics observed among Indigenous Peoples (Oelz, Dhir and Harsdorff, 2017). To reach successful climate actions, Indigenous Peoples should be considered as important agents of change as they utilize their traditional knowledge to reach effective climate actions. When they participate in this development, they should have access to decent work possibilities. The International Labour Organization's (ILO's) Decent Work Agenda aims to empower Indigenous Peoples and reach "a just transition towards environmentally sustainable economies and societies for all" (Oelz, Dhir and Harsdorff, 2017). García Guerrero *et al.* (2021) analysed the possibilities of human development and decent work among Indigenous Peoples in Ecuador. They found the following preconditions to be important: adopting legal frameworks and respecting people's rights, distributing public resources better, implementing monitoring systems, developing solidarity markets and improving the participation of poor people as a subject of rights.

In Brazil, forest areas managed by Indigenous Peoples have 27 times lower emissions than conventionally managed forests. The main reason behind this phenomenon is the lower deforestation rate (ILO, 2019a). Indigenous Peoples, whose livelihoods depend on forests, alter forest management and use in response to climate change by different coping, adaptation, mitigation and joint strategies. A recent review on these strategies in North and South America and Asia (Bauer, 2022) found that most strategies focused on non-timber forest products, and

⁵ European Commission press release: https://ec.europa.eu/commission/presscorner/detail/en/IP_23_2061

consisted of ecologically sustainable as well as unsustainable practices. The traditional knowledge of Indigenous Peoples was utilized in several strategies. The most often named coping strategy was crop diversification, the most common adaptation strategy was to adjust hunting areas and species, and the most popular mitigation strategies were forest conservation and agroforestry. The most applied joint strategy was agroforestry. Adjusted strategies are listed in the table below.

Strategy type	Strategy
Coping and adaptation	Crop diversification, Increased non-timber forest product use, Intensified forest clearing, Agroforestry, Adopted hunting areas and species, Increasing forest cover, Integration of traditional ecological knowledge into fire management, Adapted reindeer grazing, Application of non-indigenous species and sites for livelihood and ethnopharmacopoeias, Forest conservation, Livelihood changes, Unsuitable land use and overharvesting, Relocation, Reforestation of mangroves, Adapted non-timber forest products collection
Mitigation	Land titling, Forest conservation, Reforestation, Community-based forest management, Unspecified REDD+ measures (reducing emissions from deforestation and forest degradation, conservation of existing forest carbon stocks, sustainable forest management and enhancement of forest carbon stocks), Monitoring, MRV (monitoring, reporting, verification), Forest patrolling, Anti-logging policy, Controlled burning, Agroforestry
Joint	Local institutional innovation in land tenure, Adapted reindeer grazing, Adapted hunting species, Reducing forest food, Traditional fire management, Education, Forest monitoring, Reforestation, Agroforestry, Diversification, Organic certification, Increased timber extraction, Migration, Plant protection, Enrichment planting, Adapted land-use planning, Shelterbelts

Table source: Based on Bauer (2022).

Box sources: See References.

4.1.2 Opportunities and challenges

Forestry, restoration and large-scale plantations

The increasing demand for wood can be covered by increasing production in temperate and boreal forests, and in subtropical and tropical areas by restoring degraded forests and increasing the area and productivity of planted forests. An additional 20–40 million ha of commercial plantations would be needed to supply the estimated future demand for wood (FAO, 2022c). While forest restoration is often undertaken for improving the provision of different forest ecosystem services and for improving local livelihoods, timber production features prominently in national targets. A large part (45 percent) of national restoration commitments to be achieved by 2030 under the Bonn Challenge include establishment of commercial monoculture plantations, which at a global level would total over 100 million ha and would mainly be established for timber production. Brazil has committed to establish 19 million ha of new plantations, China 15.6 million ha and Indonesia 16.8 million ha (Lewis *et al.*, 2019). Although the huge areas involved raise questions about the feasibility of these commitments, they clearly indicate the increasing employment opportunities in the plantation sector.

An analysis of 13 country reports on the commitments towards their forest restoration targets under the Bonn Challenge revealed that 43.7 million ha are under restoration and that 354 000 jobs had been created in 2018 (Dave *et al.*, 2019). China has implemented several large-scale forest restoration and protection programmes. The Natural Forest Protection Program (2012–2019) covered over 1.3 million ha and created over 7 million job opportunities per year (FAO, 2022a).

Brancalion *et al.* (2022) estimated that in Brazil, ecosystem restoration could generate 0.42 jobs per hectare, leading to 1.0–2.5 million direct jobs if Brazil succeeds in restoring 12 million ha. However, previous experience from large-scale plantation establishment shows that the employment generation considered decent or stable has been limited due to the temporary, informal nature, seasonality and short duration of the employment (de Almeida and Delgado, 2019). In southern Chile, according to research, the expansion of large-scale forest plantations has neither improved employment opportunities nor incomes. On the contrary, it has increased poverty of both Indigenous and non-Indigenous communities with more severe negative effects for Indigenous communities (Hofflinger *et al.*, 2021). In some cases, large-scale land acquisitions for plantation purposes have reduced rural employment because they have replaced other agricultural activities that provided employment and because companies have brought employees from other regions (see Carte, Hofflinger and Polk, 2021 and Hofflinger *et al.*, 2021 for Chile). In Mozambique, Bleyer *et al.* (2016) found that forest plantations had threatened the basis of traditional rural livelihoods by the reduction in availability of natural resources and through the relocation of agricultural plots. However, at the same time there had been diversification of livelihood strategies in the communities as plantations provided formal employment and increased business and trading activities. Diversification and employment opportunities benefitted only a small part of the population. Similar impacts were found by Kainyande, Auch and Okoni-Williams (2022) in Sierra Leone. Hofflinger *et al.* (2021) conclude that “the impacts of forestry plantations depend on the agents who administer the resource and who configure unequal rights and powers in the distribution of the economic returns”.

The situation could be improved by strengthening the land and resource rights of Indigenous and other local communities and smallholders, strengthening their voice in land allocation decisions and by developing equitable company–community/smallholder outgrower schemes (i.e. systems that link communities and smallholder farmers with domestic and international buyers) and by more closely connecting restoration and tree planting with activities such as seed collection, nursery establishment, protection and management of restored or planted areas, and monitoring the condition of those areas.

The number of jobs created in restoration varies greatly between different restoration activities and tends to be higher during the planting phase than during the maintenance phase. Restoration can also lead to loss of jobs when the land targeted for restoration is protected and the activities that led to degradation are ceased (Raes *et al.*, 2021).

The global acknowledgement, as exemplified by the SDGs and private-sector sustainability standards, of the importance of ecologically and socially sustainable investments and land management includes an emphasis on better inclusion of local people and communities in forest management and use-related decision making. It includes broadening the goals of restoration programmes from focusing solely on timber to including climate, biodiversity and social goals (Sabogal *et al.*, forthcoming). This trend is changing both public- and private-sector engagement with local actors and could enable better inclusion of livelihood and employment issues in investments. The private sector is also increasingly involved in efforts to advance sustainable forestry including through certification and corporate social responsibility reporting.

Forest management

Due to increasing mechanization and digitalization, the need for mechanical work in forestry will decrease but the demand for workers with special skills will increase. At the same time, new technologies and mechanization can reduce occupational injuries and harmful exposures and create a safer working environment. Improved communication technology can decrease the negative impacts of isolated work in forests. Yet advanced technology may create new harms like problems in mental recovery and mental strain (Kallioniemi *et al.*, 2020; Siukola *et al.*, 2018).

Efforts to increase cost efficiency of timber production favours mechanization and the use of new machinery and technologies such as drones for planting seeds and detecting fires, and remote sensing for detecting changes in forest extent and condition. These types of technologies reduce the need for

low-skilled manual labour. In addition to mechanization, increasing use of contractors in silvicultural and harvesting operations and transport reduces the number of jobs, especially for local people (Owour *et al.*, 2021).

However, there are considerable differences between countries in the adoption of technology and more mechanized forestry operations, with progress being slow in low- and medium-income countries due to lack of availability or lack of resources and capacities to employ them. The forest characteristics, management objectives, ownership and the role of industrial forestry in the country are issues that affect mechanization and use of new technologies. Small-scale forestry, management of urban forests and managing forests for biodiversity and for soil and watershed conservation purposes will likely rely on more manual forest work in the future (FAO and UNECE, 2018). In production forests, environmental concerns relating to biodiversity and climate change mitigation and other environmental benefits can discourage highly mechanized timber harvesting and the use of heavy machinery. The New EU Forest Strategy for 2030 (EU, 2021) and EU Biodiversity Strategy for 2030, for example, call for multifunctional forest management and “closer-to-nature-forest management”, which may discourage mechanization in some regions, but may also encourage further development of harvesting methods.

Overall, the trend towards more specialized forest management, either for increasing the efficiency of wood production or for improving biodiversity and other environmental and cultural values, including recreation, are leading to increasing demand for skilled labour for increasingly specialized forest work. Similarly, special skills are needed for planning and undertaking forest management for multiple use forests, an important objective in European forests (FAO and UNECE, 2018).

The future demands in relation to employment in wood production include specialists in sustainable forest management, experts in wood trade, procurement, logistics and entrepreneurship, as well as machinery operators, technicians and skilled specialized forestry workers. In the field of forest monitoring and inventory, ongoing rapid technological development and digitalization decreases the need for fieldwork and increases the need for personnel trained for using geographic information systems, remote sensing and drones (FAO and UNECE, 2018).

However, mechanization and new technological solutions will not fully replace the need for working in the forests for regeneration or harvesting, especially in the context of the informal economy and small-scale operations. Yet, because of urbanization, ageing population and lack of interest from young people for forest work, some European countries have experienced shortages of forest workers (Owour *et al.*, 2021). Difficulties in finding workers for logging concessions have also been reported in Brazil (Rodrigues Ribeiro, Azevedo-Ramos and Nascimento dos Santos, 2020) and Malaysia (ITTO, 2021).

Smallholder tree planting and wood production

Increasing demand for timber and fuelwood has led to a marked increase in smallholder tree planting, and establishment of small-scale plantations. These changes have provided opportunities for self-employment and are a source of income (e.g. in East Africa). In some countries this has been promoted by government programmes (e.g. Viet Nam, China, India) (Kimambo *et al.*, 2020). A study covering three regions in the United Republic of Tanzania compared tree planting on smallholder woodlots with large-scale plantations and found that by 2018 the smallest woodlots (less than 1 ha) covered about half of the total planted area, equalling the area of government and corporate plantations. Smallholder tree planting was more recent and responded to regional timber demand (Kimambo *et al.*, 2020). However, the timber from small-scale producers is often not as high quality as that produced on large plantations and is largely used by local micro-scale and small-scale forest enterprises, while commercial plantations supply large industries and export markets (Arvola *et al.*, 2019). In addition to capacity building, access to finance, quality planting material and markets are important for supporting smallholder and community tree planting and better including them into wood value chains. Producer associations improve smallholder and community market access and support provision of larger quantities of timber.

In sub-Saharan Africa the demand for woodfuels is projected to increase with increasing energy needs, and charcoal production will continue to be an important source of employment. Woodfuel use is also high in most parts of Asia (Thiffault *et al.*, 2023). Charcoal is traded locally, but also within countries. It provides an estimated 200–350 job-days per terajoule (TJ) of energy, which is considerably more than the employment opportunities provided by alternative forms of energy such as electricity or liquified petroleum gas (Thiffault *et al.*, 2023). An important challenge is to improve the sustainability of woodfuel production and address the informality and illegalities in the sector.

The owners of small-scale fragmented forests often lack needed skills and capacities, and the small scale of their operations makes forest management planning and operations economically unviable. Innovative solutions for bringing together small-scale forest owners to profit from new opportunities provided by technological innovation and digitalization can support small-scale owners and provide employment in providing needed services. Forest producer organizations (FPOs) have an important role in this by bringing together small-scale forest owners to represent their interests, strengthen their voice, profit from larger scale planning and management, and provide better access to markets and credit. FPOs can also provide capacity building and extension, and social protection to their members (Tirivayi, Nennen and Tesfaye, 2018). FPOs could more actively try to engage young people in forest activities through training in technical and business issues (Macqueen and Campbell, 2020).

Agroforestry and NWFPs

Efforts to shift agriculture towards more sustainable and resilient production systems have raised the visibility of agroforestry within global environmental policy processes (e.g. United Nations Framework Convention on Climate Change, United Nations Convention to Combat Desertification) as well as in regional policies (e.g. EU common agricultural policy). A considerable share (21 percent) of 2030 restoration commitments under the Bonn Challenge involve agroforestry (Lewis *et al.*, 2019). Agroforestry refers to land-use systems that combine trees with temporary agricultural crops, pasture or animals. Global data on the extent of agroforestry is not available, but it is estimated to involve more than 1.2 billion people worldwide (World Bank, 2004). According to the FAO, in the 71 countries and territories that reported this land use, agroforestry covers in total 45.4 million ha (FAO, 2022a). Within the European Union, agroforestry covers more than 15 million ha and 52 million ha if reindeer herding is included (EU, 2020). Worldwide, trees are an integral part of traditional and modern agricultural practices. According to remote sensing data, over 40 percent of global agricultural land has at least 10 percent tree cover (Zomer *et al.*, 2016), but because the land use in these areas is not “forest”, these areas are not included in forest statistics. However, this suggests that the role of trees in agricultural production systems could be considerably more important than agroforestry data indicates. Agroforestry is an important livelihood strategy providing multiple benefits from on-farm employment, carbon sequestration and soil improvement to increasing availability of food, fodder and fuelwood, and can thus be an attractive restoration approach to smallholders and local communities. It also provides livelihood opportunities for youth in rural areas (Box 6).



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Increasing adoption of agroforestry practices emphasizes the need for practical knowledge on combining trees and horticulture or livestock in different circumstances, management options within these systems and optimization of land use (FAO and UNECE, 2018). Building on traditional and local knowledge on different sustainable agroforestry systems is important. Traditional gender differentiated roles, reflected in women's rights to trees, limit women's rights to timber and tree products, which are usually reserved for men. Women's roles are often limited to the collection or production of fruits, fodder and mulch, medicines and fuelwood (Kiptot and Franzel, 2011), while men are engaged in the forestry activities that relate to commercial utilization of valuable timber (FAO, n.d.).

NWFPs are important for rural livelihoods. In addition to being used for household needs, significant quantities are traded in local and regional markets, but a large part of the NWFP sector is informal and reliable global data are not available. Some NWFPs also have important international markets, including argan oil, shea butter, rattan and rattan products, gum arabic, maple syrup, cork and wild mushrooms (Laird *et al.*, forthcoming; Wolfslehner, Prokofieva and Mavsar, 2019). In Europe, the value of NWFPs has been found to amount to about 70 percent of the value of annual roundwood production when self-consumed NWFPs are included (Lovrić *et al.*, 2020). Changing values with increasing appreciation of organic, local or natural products such as wild foods and NbS for basic materials increase demand for NWFPs. Combined with product innovation, this provides opportunities for employment and generating business. Reliable global data on NWFP-related employment do not exist, but information about the number of people involved in the collection and trade of specific products gives some indication of their importance. As an example, up to 20 percent of Sudanese are estimated to be involved in gum arabic production (Hassan *et al.*, 2017), and in Burkina Faso the production of shea kernels, used to produce shea butter, provides income for over half a million people, of which 90 percent are women (Mollins, 2021). Many other NWFPs are especially important for generating incomes for women (Laird *et al.*, forthcoming).



BOX 6 – Youth and agroforestry

Agroforestry can support the transition of agriculture towards a more resilient system in the face of environmental and socioeconomic shocks. It also provides a way for young people to develop sustainable livelihoods that could enable them to stay in rural areas. A survey conducted among young people (between 15 and 35 years) in sub-Saharan Africa (65 percent of the responses were from Kenya, Uganda and Nigeria) mapped the views of young people about agroforestry. The findings showed that there is “significant interest in agroforestry and sustainable agriculture among young people, but lack of knowledge, limited access to land and shortages in capital are major barriers to pursuing such interests” (Eng, Castensson and Hansson, 2022 p. 2). Secure access to land is a challenge for youth, and especially for young women (HLPE, 2021). The survey also suggested ways forward to improve the involvement of youth in agroforestry including capacity building, education and supporting networks. Associations (e.g. farmer associations) and networks can support young people through mobilizing collective voice and action, supporting access to finance and strengthening youth's voices in decision making. Networks and mentorship can support the transfer of knowledge on agroforestry practices, including experiences and traditional and Indigenous knowledge. Targeted funding to build networks, and for existing networks, and farmers' associations to strengthen support to youth, could be used to reinforce this. Furthermore, a holistic approach in rural development policies that address the multiple aspirations and needs of youth is needed to create an environment that enables youth to access services and seize opportunities to utilize the full potential of their assets and abilities to shape their own destiny (Eng, Castensson and Hansson, IFAD, 2019).

Sources: See References.

Decent work challenges in forestry, restoration and agroforestry

The decent work challenges in forestry, restoration and agroforestry are partly similar, but there are also clear differences. The main differences relate to the nature of employment, i.e. whether it is paid labour in a SMFE or a large company or a form of self-employment in agroforestry, woodlots or small-scale plantations. For the latter, secure rights to land, trees and produce grown are crucial for creating meaningful employment. As mentioned above in relation to agroforestry, secure access to land is often an even bigger challenge to younger people than to older people (HLPE, 2021).

While rights to agricultural land are usually clearly defined, either in statutory law or through traditional land management and allocation systems, rights to forests and trees are more complicated in many parts of the world. Globally, public ownership of forests is predominant. In Western and Central Africa 93 percent, Western and Central Asia 99 percent and South and Southeast Asia 88 percent of forests are publicly owned (FAO, 2020). Based on a dataset covering 92 percent of the global forest area, private individuals and firms own 11 percent and Indigenous and local communities 12 percent of the forest area. Indigenous Peoples and local communities hold legally designated rights to 2.2 percent of the publicly owned forests (Rights and Resources Initiative, 2018). Most of the forest area either legally owned by or designated for Indigenous and local communities is located in Latin America, followed by Asia and then Africa (Rights and Resources Initiative, 2018). Often formal rights only allow collection of NWFPs and fuelwood but do not include rights to harvest timber. Lack of secure rights undermine investment in sustainable forest management, restoration and tree planting.

Women's rights to land and resources are in many countries generally weaker than men's rights. Furthermore, community or customary norms have led to clear gender differences in the use of forests and allocation of tasks in agroforestry and woodlots, but with strong regional differences. In general women collect NWFPs, fuelwood and fodder and take care of fruit trees, while men engage in planting and harvesting trees for commercial purposes (Arora-Jonsson *et al.*, 2019; Sunderland *et al.*, 2014).

Smallholder and community tree planting and plantation establishment is further hampered by lack of resources (finance and planting materials), skills and access to remunerable forest-based value chains (FAO, 2013). These challenges are even more pronounced for youth and restrict their participation in tree planting and developing forest activities (Eng, Castensson and Hansson, 2022). Self-employed and informally employed are not covered by national labour legislation and lack all social protection, for example, for unemployment, old age, accidents and health issues (FAO, 2013).

Common tasks for forestry, restoration and agroforestry include site preparation, planting, silvicultural treatments, and wood harvesting. These tasks share common decent work deficits. These activities take place in the field, often involve hard manual labour and expose workers to extreme weather conditions. Mechanization can raise productivity and reduce accident risk, but it can also reduce the number of jobs. It can also involve costs that are prohibitive for small-scale operators (ILO, 2011; FAO, 2013).

Logging, especially, is physically demanding and often poorly organized and supervised, and when inadequate equipment and tools are used without safety measures it can expose workers to high levels of noise, vibration, chemicals and serious accidents (FAO, 2013; Garland, 2018; ILO, 2011). Working and residing in forests exposes forest workers to malaria, Zika, Ebola and other diseases (McFarlane *et al.*, 2019). Extractive industries such as mining and logging increase movement of trafficked women and prostitution (Farley, 2022), which increases the spread of sexually transmitted diseases.

A large number of forest workers, especially in low- and lower middle-income countries, but in high-income countries as well, work on temporary bases without formal contracts and without any form of social protection (ILO, 2011). Informality is a particularity pervasive problem within SMFEs, which provide work for the majority of forest-sector workers (ILO, 2019a). Forest certification requirements and corporate social responsibility obligations have led larger, internationally operating or export-oriented companies paying attention to working conditions, health and safety, and workers' rights, including minimum wage requirements as required in the ILO international labour standards.

In sub-Saharan Africa, scarcity and fragmentation of forests have also led to a shift from large-scale concession models to increasing involvement of small-scale operators mostly working informally (Kambugu *et al.*, 2021). Due to informality and dominance of a low-skilled workforce, the wages of forest workers are generally low. The work in SMFEs is often less productive and secure and the salaries and work conditions tend to be worse than in large enterprises. The wages of migrant workers have also been found to be lower than those of formal workers. The large share of informal workers in forestry is reflected in the low level of organization of forest workers (FAO, 2013). Women are more often informally employed than men, especially in the subsectors of forestry and logging in Asia and Africa (Lippe *et al.*, 2022). In sub-Saharan Africa this relates to the importance of wood for household energy and the central role that women and girls play in fuelwood collection (Lippe *et al.*, 2022).

Youth are more often informally employed than adults, especially in low- and middle-income countries. Globally, over three-quarters of working youth have informal jobs across sectors (ILO, 2017c). Child labour is prevalent in agriculture and forestry, exposing children to health and safety risks and preventing them from attending school. Children climb trees to harvest honey and fruits, collect rubber, and participate in planting and logging (ILO, n.d.; FAO, 2013). Moreover, children who are of the national legal working age but under 18 and engaged in hazardous work are considered to be involved in child labour. Given the hazardous nature of the forest sector, child labour can be prevalent. This can include young people working with sharp and dangerous tools such as chainsaws, engaging in various forest-related activities without proper personal equipment, and much more.

Forest workers, supervisors and managers regularly lack the skills and competences needed. In many countries training opportunities and skills development are very limited or non-existent, or available only for higher-level positions. The situation is even more challenging for women and youth. Due to harsh working conditions, manual work, low wages, and low profitability of SMFEs, forest work is not attractive to youth and their employment in forestry has declined in many countries (FAO, 2013).

4.2 Forest industry (manufacture of wood, wood products, paper and paper products)

4.2.1 Wood and wood products manufacture

Current importance and potential

At the global scale wood and wood products manufacturing companies differ considerably from each other with respect to production capabilities, access to markets, timber availability, operating environment, employment opportunities and labour needs. The industry includes big companies acting globally and investing in high-quality production and research and development, but it also includes small local producers with a low degree of processing.

Many of the companies in the wood and wood products manufacturing industry produce sawnwood and wood-based panels (plywood, veneers, particleboard and fibreboard), but also some other products (e.g. manufacture of assembled parquet floors, other builders' carpentry and joinery, wooden containers). Globally, the highest production volumes are in sawnwood production. According to FAOSTAT in 2021, annual global sawnwood production was 494 million m³. The production volume of wood-based panels was smaller (415 million m³ all subcategories combined). Of individual countries, the biggest sawnwood producers are China, the United States, the Russian Federation and Canada.

Regionally, sawnwood production volumes are highest in Europe (35 percent of global production), Asia (30 percent), and North America (25 percent) (FAOSTAT). Latin America and Oceania account for only a small share of global production. Furthermore, according to FAO statistics only 2 percent of global production takes place in Africa. This small share is to some extent explained by the use of informal timber. For example, in Central Africa urban timber markets are primarily supplied by informal sources. The volume and value of these timber flows are not recorded by the government and are not reflected in national production statistics (Bayol *et al.*, 2022; Lescuyer *et al.*, 2017). In wood-based panels China plays a major role, as it covered 44 percent of global production in 2021 (FAOSTAT).

FAO's forest sector outlook study (FAO, 2022c) examined the historical trends in the global wood products trade. The study shows that export has become increasingly important for sawnwood producers in the world and around 32 percent of global sawnwood production was exported in 2020. Europe, North America, Latin America and the Caribbean, and Southeastern Asia are the most important net-exporting regions. Eastern Asia is the major net-importing region. In wood-based panels, global importance of exports has declined from 31 percent in 2000 to 24 percent in 2020. According to FAO (2022c), this indicates that panels are increasingly used by secondary processing industries within the regions.

According to Lippe *et al.* (2022), in 2017–2019 wood and wood products manufacturing employed 19.4 million persons globally, which is 58 percent of global forest sector employment. Employment was highest in Asia, which accounted for 73 percent of worldwide wood and wood products manufacturing employment. Globally, employment in wood and wood products manufacturing has been declining, although Lippe *et al.* (2022) estimates show an increase after 2011–2013 in some regions (Africa, Oceania). The proportion of female workforce in the wood manufacturing subsector is approximately 21 percent in the 63 countries for which data were available. Among the regions, the share of female workers is highest in Asia (mostly employed in informal jobs).

The global trends discussed in Chapter 1 will play out differently in different regions and have divergent impacts on the demand for wood products. They are also shaped by national forest and forest-related strategies and policies focusing on a transformation towards a green economy and bioeconomy. Technological development and innovation are introducing new value-added products, and products that can substitute for non-renewable materials. Of the latter, examples are mass timber and engineered wood products used in construction. The trend of substituting non-renewable materials with selected forest-based renewable ones (mass timber in construction and manufactured cellulose fibre) could increase employment by 1–4 percent and more if other new innovative wood products expand their market shares (FAO, 2022c).

In the FAO forest sector outlook study, it was estimated that global demand for wood products would increase remarkably by 2050 (FAO, 2022c). The consumption of wood-based panels is foreseen to increase significantly (102 percent for veneer/plywood and 72 percent for particleboard/fibreboard). Consumption of sawnwood is assessed to increase by 30 percent. The highest demand increase would occur in Eastern Asia. At a global scale, population growth is one of the driving forces of increasing demand. In addition, economic growth and urbanization have a major impact.

Increasing the use of wood in construction is supported in many countries by government policies and changes in building codes that enable and support the use of wood in multistorey buildings. Currently, modern wood construction is concentrated in high-income countries in Europe, and in North America, Japan and Australia, but in lower income countries wood is still used as a traditional building material. Due to increasing population and urbanization, a large potential for modern wood construction exists in Asia and especially in Africa, but its development is hindered by high costs and lack of required knowledge and capacities (FAO-ACSFI, 2020).

The FAO forest sector outlook study also estimated that depending on the use intensity of wood industry residues, the resulting industrial roundwood demand may be 0.5–0.9 billion m³ higher in 2050 compared with demand in 2020. In addition, up to 199 million m³ would be required to substitute for non-renewable materials (in mass timber and manufactured cellulose fibre production) (FAO, 2022c).

Scarcity of wood is thus one of the limiting factors for the future growth of the sector. The surface area needs for additional commercial plantations to supply future demand has been estimated to be between 20 million ha and 40 million ha (Korhonen *et al.*, 2021; FAO, 2022c). FAO (2022c) analysis showed that 33 million ha of additional highly productive commercial plantations could meet 2050 demand growth. In the European Union, climate and environmental policies can increase the area of protected forests and lead to changes in forest management, reducing industrial wood production.

In some areas, like Central Africa, availability of legal wood is limited (Lescuyer *et al.*, 2017). For the exporting industry, legal wood that meets an internationally recognised forest certification scheme, and preferably at

a reasonable price, is vital. There are, however, differences between export markets. According to Bayol *et al.* (2022), who examined timber sector trends in the Congo Basin, the implementation of stricter European control measures to guarantee the legality of wood, notably the Forest Law Enforcement, Governance and Trade Voluntary Partnership Agreements, has driven wood export from Central Africa to Asia instead of Europe. In 2019, China was the largest importer of Central African wood products (Bayol *et al.*, 2022). Export from Central African countries to Viet Nam was also important.

Opportunities and challenges

As global demand for wood products increases there will be need to invest in new production capacity. Where new investments will take place depends on the availability of wood raw material, market access and how enabling the operating environment is for investments (FAO, 2022c). In principle, increased production should lead to increased employment. However, given that at the same time productivity will likely increase, the employment trend is not clear.

In some countries plantations have been established to advance the wood products industry and to replace import (or use) of wood from natural forests. For example, in Viet Nam, where the wood products industry has been growing significantly during the last two decades, the importance of domestic plantation wood for the country's wood product industry has increased (see Iwanaga, Duong and Minh, 2020). As wood production is substantially in the hands of hundreds of thousands of small forest growers (Iwanaga, Duong and Minh, 2020), use of domestic plantation wood in manufacturing also creates employment in domestic forestry. Government decisions affecting wood availability in Viet Nam have included expanding plantation forest areas, banning export of timber and sawn timber from natural forests, banning import of timber from the Lao People's Democratic Republic and Cambodia, and banning logging in natural forests (Iwanaga, Duong and Minh, 2020). Also in China, forest area and forest stock have expanded significantly during the last 40 years. The rapid growth of China's wood products industries has, however, relied on increasing quantities of imported timber, with a dependency rate of 40% in 2017 (Ke *et al.*, 2021). Large wood-based companies in China can drive the development of the entire value chain, including upstream small to medium enterprises, which can contribute to the growth of employment opportunities and poverty reduction, in particular in rural areas (DRC of NFGA, 2020).

To create export income and increase employment, the production of higher value-added products would be needed. However, some forest-rich Central African countries are still lagging far behind in creating higher value-added products. Lack of infrastructure, high transport costs and a failure to train people are among the reasons (Bayol *et al.*, 2022). Consequently, many operators in the subregion are currently seeking markets that are less demanding in terms of quality (Near East, China) (Bayol *et al.*, 2022). Access to markets and development of higher value-added products are linked, and willingness to access certain markets may, in the best case, lead to higher value-added production.

In general, major challenges restraining investment in lower income countries are caused by the poor investment environment, which is due to poor rule of law, heavy bureaucracy, corruption, or other challenges like poor infrastructure or lack of a skilled labour force. The government can improve the investment environment with various policy measures (see Box 7), but significant progress may take years or decades to achieve. Availability of a skilled labour force is often one of the hindrances for new investments in lower income countries but governments, through education policies, play a major role in guaranteeing the supply of a skilled labour force. However, wood manufacturing companies need to also be ready to offer more specific training themselves.

In higher income countries, opportunities and challenges of the wood and wood products industry differ from lower income countries. In the European Union, one of the drivers for increasing the use of some wood-based materials is the European Green Deal, which advances wood construction and the use of long-lived wood products. The New European Bauhaus initiative promotes new sustainable ways of living and the New EU Forest Strategy for 2030 proposes measures for innovation and promotion of new materials and products to replace fossil-based counterparts. As the building sector is a high carbon emitter, using timber and wood is seen as a solution towards zero emissions. If substitution of non-renewable materials increases, this may lead to increased employment in wood manufacturing, but at the same time

employment may decline in some other sectors. Also, digitalization provides opportunities for the wood products industry to increase efficiency and improve transparency. The reduction of manual work because of automation can increase the opportunities for women to be employed in the sector. At the same time automation is likely to reduce the need for workforce but increase the need for skilled labour.



BOX 7 – Sustainable industrialization of the wood subsector in the Congo Basin – recommendations of a regional study by the African Development Bank

The African Development Bank (2019) has provided, in its subregional study on the sustainable industrialization of the wood subsector, ten recommendations for Congo Basin countries to establish favourable operational environments.

These steps are:

- ban log exports;
- increase the area of sustainably managed forests from 50 million ha to 75 million ha;
- intensify forestry concession harvests from the current 7 million m³ to 15 million m³;
- transition to a new industrial model, in which all logs undergo primary processing and secondary and tertiary processing increases by 50 percent;
- expand plantations outside forests;
- strengthen the legal regime and management rules applicable to forestry concessions;
- reduce tax distortions between countries and increase intra-African trade;
- strengthen institutions and legislation;
- invest heavily in logistics and energy infrastructure; and
- foster a new climate of trust between the banking sector, forestry investors and the wood subsector.

Sources: See References

Decent work challenges

Decent work challenges in wood and wood products manufacturing differ greatly between countries and companies. The operating environment in higher income countries is different from circumstances in lower income countries, and big, global companies are in a very different position compared with small, possibly informal operators. There are, however, also commonalities, most notably those that are related to occupational safety. Issues related to noise and dust need to be managed everywhere, and there are risks for injuries and possible exposure to chemicals.

Modernization of sawmilling and wood processing plants has improved occupational health in many places, even if modernization has also caused a reduction in employment (Ackerknecht, 2015). Ackerknecht (2015) analysed occupational accidents in forestry and wood products manufacturing in 37 different countries in North America, Europe, Oceania and Latin America in 2010–2012. According to the findings of this study, Finland was the safest place to work in the sawmilling industry (less fatal cases/million cubic metres), followed by Austria, Germany, Sweden and Chile. In wood-based panel manufacturing Finland, Sweden, Belgium, Italy and Lithuania were the safest countries (fatal cases/million cubic metres). These five countries had zero fatal cases during the studied period. In lower income countries the wood and wood products industry often includes deficits in occupational safety. In a study by Mong'are, Mburu and Kiiyukia (2017) on the sawmilling industry in Kenya, it was found that 80 percent of sawmill workers did not have any occupational safety and health training, a significant number of workers were not adequately provided with protective gear like

helmets and 45 percent encountered accidents at the sawmills. The study recommended that sawmills should develop occupational safety and health policies, safe work methods, and comprehensive training programmes to create awareness on safety, and invest in new machines as well as spare parts. In Thailand, Thepaksorn *et al.* (2017) identified existing potential risk hazards in rubberwood sawmills. The study demonstrated that workers in sawmills were exposed to wood dust and noise above permissible exposure limits. Working in sawmills was also associated with occupational accidents where hands and feet were injured, there was chemical and fungicide exposure, and there were injuries due to poor ergonomics or repetitive work.

According to Lippe *et al.* (2022), in the global wood and wood products industry the share of informal workers is many times greater compared with the number of formal workers. In Africa and Asia especially, the share of informal employment in the subsector compared with formal employment is high. For example, in India 90 percent of wood industrial workers have informal jobs (Lippe *et al.*, 2022). In Viet Nam the share of informal jobs is also high. Informal jobs are likely to have an important role in the rural economy. This was found by Adam and Pettenella (2013), who examined the informal carpentry sector in rural areas of the Sudan. The sector had a significant role in helping vulnerable rural groups obtain an extra source of income. But at the same time the results indicated that the operators face many constraints, for example, lack of finance and raw materials, insecure markets and lack of technology and organization.

As discussed in earlier chapters, informal employment as such includes many factors challenging decent work, such as issues related to the labour market, employment, skill reproduction, income, security (e.g. social security, income security) and representation (Cui, Lippe and Schweinle, 2022). In order to advance decent work opportunities in wood and wood products manufacturing, these types of general issues need to be taken into consideration. At the same time, there are specific needs within the sector. These include providing training for occupational safety issues, providing more training opportunities to increase the availability of skilled labour, investing in technology, and creating opportunities for technical exchange and capacity building. Special emphasis should be given to young people. In general, young and untrained workers are more likely to have accidents due to lack of training and experience. This exposes them to occupational injuries and illnesses.

4.2.2 Pulp and paper manufacture

Current importance and potential

In 2017–2019 the pulp and paper industry employed 5.9 million persons globally (Lippe *et al.*, 2022). Employment has been declining, but there are differences between regions. Production in the industry is dominated by big global companies, especially in North America and Latin America, Northern and Western Europe and Asia (especially China). In Latin America three countries – Brazil, Chile and Uruguay – have developed significant industrial capacity in the field of pulp and paper manufacture, although forests are important for almost all the countries of the region (Morales Olmos, 2022). In 2019 Latin America, mainly Brazil, Chile and Uruguay, accounted for as much as 38 percent of global cellulose exports (Klein and Luna, 2022).

Production volumes in Africa are very low compared with most other continents (FAOSTAT, Forestry Production and Trade). However, according to Lippe *et al.* (2022), pulp and paper production employs 418 000 persons in Africa, whereas in North America and South America, total employment is 690 000 and production volumes are tens of times higher. These figures illustrate the difference in scale and productivity. There are also differences in employment trends between the subsectors of the pulp and paper industry. For example, for years, North American and Western European paper mills producing printing and writing paper have been closed because of declining demand, whereas in other sectors of the chemical forest industry, the situation has been different. Opposing trends within the sector can well be seen in the production figures of Finland. In 2021, the production volume of paper was 60 percent lower than in 2006, whereas production of paperboard increased by 42 percent during the same time period (Statistics Database of Natural Resources Institute Finland⁶).

⁶ Statistics Database of Natural Resources Institute Finland: <https://statdb.luke.fi/PxWeb/pxweb/en/LUKE/>

According to Lippe *et al.* (2022), in the pulp and paper industry the proportion of employed women is approximately 28 percent of total employment. The share of women is largest in Asia (mainly in India and Viet Nam) and in North and South America. According to the study, in Mexico and Brazil the share of women is about 30 percent and 35 percent, respectively. In India, however, employment of women is mostly informal. Informal employment is also common in Viet Nam.

Many of the global megatrends foster demand for products of the pulp and paper industry. Increasing income levels, population growth, urbanization, changes in population structure and digitalization increase demand for packaging materials and tissue paper and thus, also need for pulp. Main reasons for increasing demand for packaging materials are changes in consumer behaviour and urbanization. Need for hygiene products is expanding as consumption patterns and needs are changing in population-rich areas like Asia. Need for packaging materials is growing as food is often bought packaged from grocery stores instead of using local marketplaces. Also, fast-growing online shopping (which is an example of digitalization) is increasing demand for packaging materials. At the same time, digitalization also has negative impacts on the sector as demand for printing and writing paper has been declining for years, especially in higher income countries. Other megatrends like climate change and biodiversity loss, as well as global resource scarcity, impact directly or indirectly on pulp and paper manufacturing. Some products of the pulp and paper industry have a role in replacing fossil-fuel based raw materials, especially plastics, and new products are under development.

Opportunities and challenges

High capital costs and long investment cycles are characteristic of the pulp and paper manufacturing sector. Requirements for high-skilled labour are higher than in other forest product industries. The number of employees (and the share of employment costs of total production costs) is significantly less than in the sawmilling industry. This is especially the case in new, large mills, despite their location. A new 1.5 million t pulp mill that has recently been started up in Kemi, northern Finland, employs approximately the same number of people that the old mill employed even though annual production of the new mill is 2.5 times higher. In addition to the pulp mill, there are employment impacts in wood procurement, and employment in wood procurement will significantly increase for the Kemi mill. Increase in wood procurement will create employment opportunities, especially in rural areas. In addition to employment impacts in wood procurement, an increase in pulp and paper production has other indirect and induced employment impacts.

Due to favourable tree growing conditions, for decades there has been an increased interest in establishing plantations in the southern hemisphere, especially in Latin America and Asia, and to some extent also in Africa. However, in addition to favourable growing conditions, societal issues like well-functioning institutions, rule of law and social stability play an important role when global companies make investment decisions. Because of this, large-scale investments are usually directed to only a few countries, and investments in Africa have been few. One of the countries that has been able to attract foreign pulp and paper industry investments is Uruguay. The operating environment in the country is considered stable and predictable and the Uruguay government has created incentives for global companies to invest. *Act No. 15.939* (Forestry Law), which was originally approved in 1987, provides financial incentives to increase plantations (Morales Olmos, 2022). Furthermore, the law assured protection for both foreign and domestic investments in forests and forest products (Morales Olmos and Siry, 2009). More than 90 percent of commercial plantations in Uruguay are certified by FSC or PEFC, which gives Uruguayan pulp a marketing advantage for access to certain markets (Morales Olmos, 2022).

Scarcity of land and increasing competition with other land uses, especially agriculture, have complicated establishment of plantations and caused conflicts with local populations. For example, this has happened in China, where production from the pulp and paper industry has significantly increased during the last two decades, but forest resources available for industrial use are too scarce compared with demand. In Latin America, raw material for pulp manufacturing predominantly comes from pine (*Pinus* spp.) and eucalypt (*Eucalyptus* spp.) plantations that operate under agribusiness models, which offer considerable employment during the investment phases, but the amount of workforce needed decreases at later stages.

Also, the type of labour needed changes with time, and times of boom can affect employment in other sectors. This has been the case in Uruguay's pulp industry, where the demand peaks for seasonal workers for planting and harvesting eucalypts has created shortages of labour in the surrounding countryside (Pakkasvirta, 2012).

Beyond the challenges related to industrial plantations that were discussed in more detail in Section 4.1, it is important to bear in mind that the establishment of industrial forest plantations can also cause other more indirect effects on employment opportunities, and the distribution and quality of jobs. Namely, the environmental impacts⁷ of large, monoculture forest plantations alone may be important (Lewis *et al.*, 2019; Brancalion and Holl, 2020), and they are often reflected in the extent, quality and economic value of natural forests (Pirard *et al.*, 2016), as well as how forests are used and by whom (Gerber, 2011). Whether from previous agricultural land or from natural forest, conversion to forest plantations may contribute to the displacement of local populations, consequently replacing existing forms of employment by wage labour (Malkamäki *et al.*, 2018). Subsistence use and the harvest of NWFPs from natural forests more often employs women, the Indigenous population, and youth whereas wage labour in plantation forests is more likely to offer jobs principally for men. However, there are new employment options available to women in particular, such as mushroom collection (Argentina) and salaried work in tree nurseries (Uruguay) that have been reported as linked to plantations (Malkamäki *et al.*, 2018).

Demand for pulp and paperboard will continue to grow in the coming years and at a global scale the need for wood fibre will increase. Because of this, production volume will grow. FAO's forest sector outlook study (FAO, 2022c) estimates employment in the pulp and paper industry to increase by 9 percent by 2050. At the same time, however, there will be changes in production structure and bigger and more efficient mills will partly replace older, more labour-intensive production facilities, decreasing the need for a labour force compared with older mills. Change to modern mills would possibly decrease negative impacts on the environment, like air pollution or impacts on waters. In developing countries with insufficient adoption of advanced pulp and paper manufacturing technologies, the sector contributes to a series of environmental problems (Sun *et al.*, 2018; Shang *et al.*, 2022). In China, a significant number of older production facilities have been closed in order to reduce pollution and modernize the industry (see Zhang, Chen and Wen, 2012). Many of the facilities have been using non-wood raw materials in their production.

Many wood-based innovations have been launched in the past few years to create more sustainable textile fibres, to replace plastics, or to make batteries from tree lignin. Wood material is also needed for biofuels and bioethanol, and biochemicals are targeted for pharmaceutical industry needs. Many of these innovations are developed in biorefineries in the pulp and paper industry and they may in future increasingly provide employment opportunities in the sector. However, plenty of uncertainties related to actual impacts on employment remain.

Decent work in the pulp and paper industry

Decent work challenges of the pulp and paper sector are likely to differ greatly between mills, depending on the country of location, size of the facility and scale of production (global/local). Large global producers are likely to have similar safety standards in all of their facilities, independent of geographical location. Taking safety and well-being properly into consideration may be a part of a company's social responsibility profile and ignorance towards the well-being of employees (or contractors' employees) might cause a major reputational risk for a business. In high-income countries, forest industry (pulp and paper industry) employment and jobs are mainly formal, wages are reasonable, and employees have the freedom to organize and participate in social dialogue with employers. In small-scale mills located in lower income countries, the situation may be rather different. Safety standards may be inadequate, occupational accidents common, and implementation of national labour laws and safety regulations poorly monitored in practice.

⁷ Environmental impacts such as conversion of natural forests to plantations that, for example, decrease carbon stocks in forests and diminish their biodiversity fall beyond the scope of this report. We only refer to them as far as they have clear impacts on forest sector employment.

Compared with other forest sector subsectors, the role of informal work is smaller in the pulp and paper industry. According to Lippe *et al.* (2022), there was no informal employment in the subsector in Europe, and in North and South America the share of informal work is relatively small. Globally, the share of formal employment was discovered to be slightly higher than the share of informal employment.

The well-being of Finnish forest industry workers was studied by Pahkin (2015). The study period was 1986–2009. The study was not limited to only pulp and paper industry workers but it also included other forest industry workers. Characteristics of that period were stable growth of the enterprises, remarkable international expansion and organizational downsizing. The status of well-being was found to be relatively stable during the study years. Those who felt their well-being was poor had poorer working conditions, their resources were weaker (e.g. a weak sense of coherence⁸) and they did not have social support. Negative personal assessment about the change increased the risk of lower well-being. On the other hand, elements increasing employee well-being were a strong sense of coherence, social support and a positive attitude towards changes (restructuring) and their consequences. Overall, the restructuring process created a trend of decreasing well-being among employees. Possibilities to participate, communication, support and justice can promote the ability of employees to cope during organizational changes (Pahkin, 2015). In another study, Pahkin *et al.* (2014) observed that among paper industry blue-collar employees, negative change appraisals increased the risk of experiencing more stress and less work enjoyment, and diminished the motivational aspects of well-being.

In Australia the well-being of forest-sector workers was studied using an online survey (Mylek and Schirmer, 2015). This study included pulp and paper industry workers and other forest-sector workers. The study does not present results for forest industry subsectors, instead the pulp and paper industry and wood product industry were combined. In the study, wood- and paper-manufacturing workers reported the poorest health scores and the lowest satisfaction with nearly all dimensions of their lives compared with other subsectors in the sample. In addition, the injury rate was the highest among wood- and paper-manufacturing workers and higher than among the Australian workforce in general. The respondents who worked a rotating shift (mainly wood- and paper-manufacturing workers) were significantly more likely to have experienced a workplace injury during the last 12 months than workers with non-rotating shifts. Based on the results, it was proposed that rotating shift work and stress management procedures should be improved. Also, efforts to create better community connections, including better work–life balance, would improve well-being (Mylek and Schirmer, 2015).

4.2.3 Services: Nature-based tourism

Current importance and potential

In addition to forestry and the forest industry, the service sector also supports forest-based livelihoods. Services include a wide range of activities, but here we concentrate only on nature-based tourism – a subsector for which many countries have high expectations. The non-material benefits from forests include possibilities for recreation and tourism, health and well-being, as well as opportunities for spiritual enrichment and cognitive development (Millennium Ecosystem Assessment, 2005). The demand for these types of benefits has grown due to social and demographic changes, and environmental changes such as climate change and forest degradation and loss.

Nature-based tourism involves a large number of different outdoor activities, such as hiking, backpacking, skiing, camping, hunting, fishing, bird watching and biking (e.g. Margaryan and Fredman, 2017; Haukeland *et al.*, 2023). Furthermore, activities that take place partly or entirely in a forest environment include safaris and wildlife-watching activities. Some of the activities can be performed without commercial operators, but for some operators are needed. According to Haukeland *et al.* (2023), many of the activities are increasingly diversified and specialized due to development of online technology, better equipment, and a more professional service delivery. Together with consumers' increasing income and the growing outdoor retail industry, this creates new business opportunities within the nature-based tourism sector.

⁸ A sense of coherence is a construct describing a person's personality and their ability to cope with adverse experiences, such as external stimuli and stressors.

According to the World Travel and Tourism Council (WTTC), the travel and tourism sector (including the sector's direct, indirect and induced impacts) was, prior to the COVID-19 pandemic, one of the world's largest sectors, accounting for one in four of all new jobs created in the world, 10 percent of all jobs (333 million), and 10 percent of global GDP (USD 9.6 trillion) (WTTC, 2022). In 2021, the share of the global GDP was 6 percent, but already higher than in 2020, which was a gloomy year for tourism because of the pandemic. The WTTC is expecting that between 2022 and 2032 the sector's contribution to the global economy will grow at an average annual rate of 5.8 percent (the average annual growth rate estimated for the global economy as a whole is 2.7 percent). In that same period, the sector is forecast to generate 126 million additional jobs. In many countries, tourism employs more women and young people than most other sectors. Globally, the majority of workers are under 35 years of age, half of whom are 25 or under (ILO, 2017b). Also migrant workers are an important workforce for the sector.

Nature-based tourism is one of the fastest growing subsectors of tourism. Lack of monitoring and statistics (Fredman and Tyrväinen, 2010; Spenceley, 2021; Spenceley *et al.*, 2021), however, challenges the assessment of its benefits for society. Even more challenging is the ability to form a comprehensive view of the economic importance of forest-based recreation and tourism.

The growth in nature-based tourism is based on global trends. Urbanization, economic growth, increasing incomes and flexible working hours have all led people to spend more time and money on nature-based experiences. In addition, tourists of emerging economies, such as China and India, are expected to contribute to a significant further expansion of tourism in the near future (Øian *et al.*, 2018). Nearly 700 000 jobs were created in more than 15.6 million ha of forest parks of China in 2018 (FAO, 2022a). Growth has also created job opportunities. One of the countries that has been able to create significant economic value from nature-based tourism is Costa Rica. Tourism represents 7 percent of the national GDP of Costa Rica, and it employs 3 percent of the working population directly and a further 9 percent indirectly (Echeverri *et al.*, 2022). Approximately 70 percent of all international visitors to Costa Rica state that the wildlife, dramatic scenery and opportunities for adventure sports are the main motivation for visiting the country (Echeverri *et al.*, 2022).

One of the forms of nature-based tourism is wildlife tourism. Global economic importance of wildlife tourism has been assessed by the WTTC (WTTC, 2019). In the study, wildlife tourism was defined as viewing and experiencing animals in their natural habitat. According to the study, wildlife tourism directly contributed USD 120 billion to economies in 2018; with multiplier effects the impact was USD 343.6 billion (Table 3), which is 3.9 percent of global travel and tourism GDP in 2018. Employment impacts were estimated to be 6.8 percent of total travel and tourism jobs. In Africa, wildlife tourism was estimated to represent over one-third of travel and tourism revenue.

TABLE 3 Direct and total economic contribution of wildlife tourism in 2018 according to WTTC (2019)

Continent	Direct				Total	
	Expenditure (USD billion)	GDP (USD billion)	Share of travel & tourism (%)	Employment (million)	GDP (USD billion)	Employment (million)
North America	25.4	13.5	2%	0.2	37.6	0.5
Europe	28.5	13.3	1.6%	0.2	35.4	0.6
Africa	48.8	29.3	36.3%	3.6	70.6	8.8
Asia-Pacific	118.2	53.3	5.8%	4.5	171.2	10.4
Latin America	19.9	10.7	8.6%	0.5	28.9	1.4
Total	241.0	120.1		9.1	343.6	21.8
Share of total global travel & tourism (%)	4.2%	4.4%		7.4%	3.9%	6.8%

Sources: Oxford Economics. Figures may not sum to totals due to rounding. Also: WTTC (World Travel and Tourism Council). 2019. *The economic impact of global wildlife tourism: Travel and tourism as an economic tool for the protection of wildlife – August 2019*. World Travel and Tourism Council. <https://wttc.org/Portals/0/Documents/Reports/2019/Sustainable%20Growth-Economic%20Impact%20of%20Global%20Wildlife%20Tourism-Aug%202019.pdf>.

Opportunities and challenges

Nature-based tourism often takes place in protected areas, but not all protected areas are suitable for tourism. Possible impacts of tourism on valuable nature need to be considered and the sites must be attractive from the visitor's point of view. What is attractive varies between segments of population but may include – in addition to a spectacular site – demands for infrastructure, accommodation, services and more general demands related to the security situation in the country or taking sustainability aspects into consideration.

Economic impacts of nature-based tourism are created from the money that visitors spend on entrance fees, tours and activities, accommodation, food and drink, transport, and other services. Nature-based tourism businesses are typically located in rural regions and the sector, thus, creates opportunities for diversifying rural livelihoods and poverty reduction. To have significant employment impacts, a variety of services need to be provided, and to have an impact on the local economy, service providers should be local and they should use local inputs as much as possible. Job and Paesler (2013) compared leakage of tourist receipts at restaurants in Wasini Island in Kenya. They found that with locally owned restaurants, nearly half of the tourist receipts remained on the island, whereas the internationally owned business reported a leakage rate of 92 percent (and the main part of that leaked to outside the country).

Several authors have found tourism to support biodiversity conservation, for example by providing an economic justification and financial support for conservation and an economic alternative to other forms of development that negatively impact biodiversity (see Box 8) (Hoang *et al.*, 2020). Furthermore, the involvement of local people in the maintenance of biodiversity may support reaching conservation goals. If forest-based tourism creates positive economic impacts on a local economy, it can lead to greater acceptance of forest cover maintenance and forest conservation practices, and thus decrease forest degradation and deforestation in the long run. This is particularly important in lower income countries, where there may be high pressure for forested land to be used for other purposes. In Kenya, Job and Paesler (2013) found that intensification of tourism led to less intensive use of land for agricultural purposes (see Box 9). Use of protected areas for nature-based tourism may, however, be hindered by lack of people with needed skills. For example, in Cameroon there is a shortage of well-trained and skilled professional staff needed to oversee and effectively coordinate the management of the different tourism activities, natural parks and sites in the country (Kimbu and Tichaawa, 2018).

However, direct negative impacts of nature-based tourism on the local society, culture and environment have been reported. Not all households can participate in tourism-related activities, either because they do not have the ability to make the financial investment needed or because of a lack of appropriate schooling and skills (Hoang *et al.*, 2020). They may even lose their livelihoods because of nature-based tourism (Sebele, 2010). This can lead to economic or environmental duality in the local society. Hoang *et al.* (2020) have analysed the association between tourism development, local livelihoods and land cover change at the household level in northern Viet Nam. The results of the study show that tourism increased the living standard of ethnic minorities and led to more intensive farming systems, with forest regrowth on abandoned fields. The benefits were, however, found to be concentrated among a small group of rural households. The additional income allowed beneficiaries to gain a higher income and invest in modern agricultural practices, leading to agricultural intensification and abandonment of steep uplands.

Haukeland *et al.* (2023) analysed nature-based tourism trends with the largest commercial potential in five countries or regions: Norway, Sweden, Finland, the European Alps, and the western United States. The largest commercial opportunities within the next 10 years were found to relate to trends in health, sustainability, soft adventure, digitalization and professionalization. Many of the above-mentioned trends could advance participation of women and young people in the activities of the sector. Digitalization refers here to digital marketing, trip planning and booking, and professionalization to increasing interest in professional, well-informed guiding services. The willingness to pay for such skills is expected to continue to grow.



BOX 8 – Contribution of Greater Kruger National Park (GKNP) on South Africa's economy

Chidakel, Eb and Child (2020) estimated the contribution of GKNP on South Africa's national economy. GKNP is an integrated network of reserves of low-lying savannahs. In addition to Kruger National Park, GKNP also includes three provincial reserves and a network of private reserves. Chidakel, Eb and Child estimated the economic contributions of tourism spending in the local area and overall impacts, including multiplier effects at the national level. The study used several surveys, which focused on visitors, tourism businesses, employees and reserve managers.

The study concluded that there were nearly 3.5 million visitor-nights and day-visits in GKNP in the study year, 35 percent of which were by foreigners. GKNP contributed ZAR (South African rand) 6.6 billion to the South African national economy when accounting for supply chain multipliers. Furthermore, for every direct job in GKNP, another 1.43 jobs were sustained locally and nationally outside of the system. The study also found that although private reserves constituted only 12 percent of the studied land area and less than 17 percent of visits, visitor spending there was responsible for over 60 percent of employment, tax and gross domestic product (GDP) contributions. The study concludes that statutory protected areas (e.g. national parks) can serve as powerful catalysts for the growth of large and vibrant wildlife economies on neighbouring private land.

Sources: See References



BOX 9 – Nature-based tourism in protected areas of lower income countries

Nature-based tourism in protected areas of low-income countries can help to develop rural areas and reduce poverty. In order to develop sustainable nature-based tourism, several issues have to be taken into account. Job and Paesler (2013) have listed the following ones:

- Focus on a close relationship with the local population and participatory development of management options.
- Install fair institutional arrangements.
- Facilitate the opportunities of nature-based tourism with essential training in business skills, guiding and production of local goods and handicraft.
- Encourage community members to avoid a total dependence on nature-based tourism by maintaining a subsistence economy for times of crises.
- Communicate that locally embedded tourism development takes time and is unlikely to improve the local economy immediately.

Source: See References.

Decent work in nature-based tourism

SDGs include several targets related to tourism. Its importance as a driver for job creation and the promotion of local economic development, local culture and products is reflected in SDG 8: “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all” (ILO, 2017b).

Despite tourism’s potential to promote growth and employment, there are decent work challenges in the sector. According to ILO (2017b), the high incidence of informal working arrangements is an important challenge for advancing decent work in tourism. Furthermore, low-skilled and unskilled workers often find themselves in the most vulnerable jobs, where they are more likely to experience poor working conditions, inequality of opportunity and treatment, violence, exploitation, stress and sexual harassment. This is especially the case for women and younger workers. Moreover, certain jobs in the sector are characterized by low wages, long working hours, a high turnover rate, and limited social protection. Shift and night work, seasonality, temporary and part-time employment, and an increasing rate of outsourcing and subcontracting are frequent (ILO, 2017b).

Challenges in decent work differ between lower and higher income countries. Reasons for that include differences in legal frameworks, rule of law, provision of needed education and existence of other employment opportunities. There are, however, some similarities like seasonality, long working hours and profitability of entrepreneurship. In Sweden, Sörensson and Dalborg (2017) examined female entrepreneurs’ ambition, working conditions and life situation in nature-based businesses in sparsely populated areas of the country. The results of the study show that female entrepreneurs in nature-based businesses are mainly driven by a great interest in nature and wildlife and that entrepreneurship is opportunity based. The study showed that it is often difficult to make a company profitable and the work requires long days, but the entrepreneurs mostly found work rewarding. One of the main reasons why they started their own business was independence.

Tourism can empower women by creating income opportunities and jobs. However, gender-related inequalities are frequent in the sector. Women are often over-represented in lower skills and lower paid areas, with low-skilled and unskilled women often holding the most vulnerable jobs (ILO, 2017b). Young people and migrant workers often face these same problems. Gender aspects in community-based ecotourism was examined by Walter (2011), who considered it to hold great promise in promoting environmental conservation, local livelihood, and cultural preservation. The study provided guidance for how to apply gender analysis in that context, and argued that without a clear understanding of the differential benefits and costs of community-based ecotourism for men and women, policies may promote the welfare of men over women. According to Walter (2011), factors that should be considered include the gendered division of labour, gender relations, and differential access to and control over environmental, livelihood and cultural resources. How these factors are taken into consideration affect the empowerment of women in changing circumstances.

5. Main findings and policy implications

5.1 Main global trends affecting the future of forests and forest employment

The interlinked global long-term environmental (such as climate change, resource scarcity and environmental degradation), socioeconomic (including demographic) and political trends and technological developments (including digitalization) are leading to changes in forests and how they are used and valued. This includes changes in forest cover and condition, forest biodiversity, how and for what forests are used and managed, what kinds of products are produced from wood and non-wood raw materials and where production is taking place, and, more generally, how the range of forest ecosystem services are valued, sustained and supported. These changes and their impacts on forest-related employment are shaped by global environmental agreements and commitments as well as by national economic and sectoral policies. For the future of forests, the extent of forest resources and forest-based economic activities for livelihoods and the economy are of crucial importance. Moreover, the development of other land-based sectors, mainly agriculture and mining, and minimizing the trade-offs between these and the forest sector is needed, including other manufacturing industries that compete or collaborate with the forest industry.

Overall, the demand for forest-based goods and services is increasing due to population growth, urbanization and increasing incomes. Yet, a notable change that will bring long-term impacts on forests relate to their role in climate change mitigation through carbon sequestration and storage and in substituting for fossil-based materials and energy, in supporting the availability and quality of water, and in providing a habitat for most global biodiversity. This is clearly manifested in the current shift towards green economy and bioeconomy. The shift also represents a significant opportunity for young people to play an active role in building a more sustainable future. By embracing sustainable practices and taking advantage of emerging job opportunities, young people can help to drive the transition



towards a greener and more sustainable global economy. Together with technological development and digitalization, this shift will alter traditional forest-sector employment but will also provide new employment opportunities in the forest sector as well as in other sectors relying on wood and innovations that use forest-based materials such as construction, textile and chemical industries. How these opportunities will unfold will also depend on private investment in new wood-based products and related production capacities.

Another important trend is the increasing appreciation of forests as an environment for recreation and tourism and for providing cultural services and well-being. Efforts to accommodate the different demands for forests, from carbon sequestration, to landscape values, and wood production, places new challenges for forest management and governance. Forest managers and decision-makers need to have a broader understanding of societal values, equity, and economic values and their integration in and around forests and have the skills needed to manage forests for multiple goods and services.

The importance of the above-mentioned trends and the pace and direction of change varies among regions and countries. At the global scale, forest sector employment has been declining. According to recent estimates the forest sector employs 33 million people (Lippe *et al.*, 2022). Employment is estimated to stay at this level up to 2050 if substitution for non-renewable materials is not included, but it could increase by between 1 percent and 4 percent when substituting non-renewable materials with selected forest-based renewables is included, and even more if other new innovative wood products are developed and find markets (FAO, 2022c). However, the global estimates overlook regional differences in the opportunities to increase forest employment or enhance self-employment. They also do not include the potential for new employment opportunities in forest-related service sectors such as recreation, tourism and health and well-being, nor the potential to create forest-based incomes from the provision of climate mitigation, biodiversity or watershed protection services.

5.2 Main opportunities and challenges

Estimated current employment in forestry and logging amounts to about 24 percent of total forest-sector employment, but its share is clearly higher in Africa and Oceania (41 percent) and lowest in Asia (19 percent). This subsector's share of total global forest-sector employment has remained about the same between the two periods (2011–2013 and 2017–2019) covered in the analysis of Lippe *et al.* (2022), but declined in absolute numbers.

Wood and wood products manufacturing employed 19.4 million persons globally (2017–2019), which is 58 percent of global forest-sector employment (Lippe *et al.*, 2022). Employment was highest in Asia, with 73 percent of the subsector's employment in the world. Employment in pulp and paper manufacturing was lower than in the wood and wood products industry, 5.9 million persons and 18 percent of global forest-sector employment. In this subsector, employment concentrated in Asia (64 percent of global pulp and paper industry employment). Globally, employment in wood and wood products manufacturing as well as pulp and paper manufacturing has been declining.

At the global level, the demand for wood is projected to increase. The increasing demand could, according to FAO (2022c), mostly be covered by growing production in temperate and boreal forests, and in subtropical and tropical areas by restoring degraded forests and increasing the area and productivity of planted forests. To supply for the estimated increased demand for wood, an additional 20–40 million ha of commercial plantations would be needed (FAO, 2022c). This, combined with the commitments by national governments and other actors towards restoring millions of hectares of degraded and deforested areas, will likely create new employment opportunities, especially in subtropical and tropical areas. Development of smallholder/community woodlots and tree plantations in sub-Saharan Africa and Asia, and agroforestry and NWFP harvesting globally, can also provide self-employment and part- and full-time jobs.

The increasing need for wood products creates opportunities to develop wood manufacturing industries and related exports. Domestic markets and export markets may differ significantly and for export, production of higher value-added products might be needed. Globally, a high increase is foreseen,

especially in the consumption of wood-based panels, but also in demand for sawmilling products. At the same time, manufacturing is benefitting from technological development, mills are being modernized and productivity is increasing. In future, fewer workers will be needed for produced unit (cubic metre, tonne). Technological change is increasing the need for a skilled labour force in wood products manufacturing as well as in larger scale pulp and paper industries.

The important role of forests in mitigating climate change and supporting global biodiversity is shifting forest management objectives from wood production to increasingly consider carbon sequestration and storage and maintaining biodiversity. This will affect the availability of wood for industrial purposes. Furthermore, forest management needs to reduce risks of fire, pests and damage caused by storms and other threats that are becoming more frequent and severe with the changing climate. Forest managers and operators will need skills to adapt management operations to the changing needs and increase the resilience of forests. This is also increasingly relevant for forest plantations. These changes are globally affecting the skills forestry professionals and workers need, and increasing employment opportunities for afforestation/reforestation and forest conservation (including control of fire, pests and illegal logging).

Technological development and digitalization are inducing important changes in wood production and forest management, including forest assessment and monitoring, harvesting and post harvesting work. In general, these changes reduce the need for low-skilled manual labour. This development has already led to a decrease in forest employment in temperate and boreal areas (corresponding with higher income countries). In addition to mechanization, increasing use of contractors in silvicultural and harvesting operations and transport reduces job opportunities for local people in tropical forests (Owour *et al.*, 2021). Unsustainable harvesting and a lack of sustainable post-logging management also remain serious problems in concession areas.

Future demands in relation to employment in wood production include specialists in sustainable forest management, experts in wood trade, procurement and logistics and entrepreneurship, as well as machinery operators, technicians and skilled specialized forestry workers. In the field of forest monitoring and inventory, ongoing rapid technological development and digitalization decrease the need for fieldwork and increase the need for personnel trained for using geographic information services, satellite imagery, remote sensing, photointerpretation, light detection and ranging, and drones (FAO and UNECE, 2018).

Mechanization and new technologies will also affect employment in forest plantations and their establishment, as well as in forest restoration. While the experiences from large-scale plantations are similar to those from large-scale logging concessions and indicate that employment generation is limited due to the temporary, informal nature of the work, seasonality and short duration of employment, the sheer magnitude of forest restoration commitments and the estimated need for new forest plantations will likely create new work opportunities. The number of jobs created in plantation establishment and management and restoration varies greatly between different phases and tends to be higher during the planting phase than during the maintenance phase. Longer-term employment could be generated by developing equitable company-community/smallholder out grower schemes, by more closely connecting restoration and tree planting with activities such as seed collection, nursery establishment, protection and management of restored or planted areas and in monitoring their condition, and local community and smallholder involvement in these activities.

Due to the lack of secure land rights or respect for such rights, large-scale logging concessions and plantations have contributed to conflicts with local and Indigenous communities whose land has been targeted, even leading to loss of employment when previous productive activities on the land have been ceased. Large-scale restoration efforts may include similar risks. The situation could be improved by strengthening the land and resource rights of Indigenous and other local communities and smallholders and effectively including them in land use and land allocation decision making.

Increasing demand for wood and wood energy has also led to an increase in community and smallholder tree planting, including the establishment of woodlots and small-scale plantations. Traditional wood energy

(fuelwood and charcoal) will remain the principal energy source in sub-Saharan Africa and parts of Asia for the coming decades, providing employment for a large number of people. An important challenge is to improve the sustainability of woodfuel production and address informality and illegalities in the sector. In general, smallholder and community tree planting and plantation establishment is further hampered by lack of resources, skills and access to remunerable forest-based value chains (FAO, 2013).

NWFP production and NWFP-based value chains can provide new opportunities for employment and income. In general, lack of capacities, resources and market access limit smallholder and community opportunities to establish plantations, restore degraded areas and commercialize NWFPs. The development of producer associations is important for supporting smallholder/community timber and NWFP production, employment generation and smallholder and community access to markets. Agroforestry provides underutilized potential for improving food security and providing self-employment and income. Combining traditional/Indigenous knowledge with scientific knowledge and new technologies can support the development of sustainable production systems, integrating trees with annual or perennial crops or livestock.

In many countries, there is optimism about the development of nature-based tourism. Nature-based tourism businesses are typically located in rural regions and the sector could create opportunities for diversifying rural livelihoods. To generate significant employment and income impacts, services in nature-based tourism should be provided, as much as possible, by local people and by using local inputs. This is not always possible because of the lack of needed skills, and benefits may leak outside the local economy or even abroad. If, however, tourism creates positive economic impacts on the local economy, it can lead to greater acceptance of conservation actions, and benefit them. Too intensive tourism may, however, create negative cultural and environmental impacts.

5.3 Persistent decent work challenges

In general, the forest sector faces serious decent work challenges, which are connected to the breadth of informal work in the sector as well as the nature of the sector. In the pulp and paper industry, the role of informal work is remarkably smaller than in other subsectors but is still significant in some regions of the world. Informal employment is common in logging operations, charcoal production, fuelwood and NWFP collection in lower income countries. Women are more often informally employed than men. Where data were available, informal employment accounted for an estimated 70 percent of total forest-related employment in 56 countries, but over 80 percent in most African and Asian countries (Lippe *et al.*, 2022). Informal employment has not decreased, on the contrary it increased during the COVID-19 pandemic.

One reason for the persistence of informal employment is the dominance of SMFEs, which often operate informally. Globally they provide work for the majority of forest-sector workers (ILO, 2019a). Although decent work challenges are still common globally, they are especially persistent in SMFEs in lower income countries. The profitability and productivity of SMFEs is often low and they operate outside the legal and regulatory framework, often utilizing illegally or unsustainably harvested wood. Availability of finance may be a serious constraint for developing informal wood and wood product manufacturing. The workers, supervisors and managers commonly lack the skills and competences that would be needed, and work conditions tend to be worse than in larger enterprises. Due to the importance of SMFEs, policies and measures that support formalization of their operations, improve profitability, working conditions and workers' rights hold vast potential for supporting and advancing decent work in forestry.

Common decent work challenges include low wages and productivity, temporary and seasonal work, and lack of job security and social protection, which are connected to the prevalence of informal employment. Furthermore, continuous problems affecting decent work include illegal logging, gender inequality, use of child labour, low unionization rate and lack of rights for association and collective bargaining. Forestry and logging also expose workers to unsafe working conditions, health risks and accidents (Campos Arce, 2019; FAO, 2013; ILO, n.d., 2019a, 2019b). Lack of or unsecure rights to land and resources undermine the incentives for smallholder, Indigenous and local communities to invest in land and create jobs or

self-employment. In lower income countries, the wood and wood products industry often has deficits in occupational safety. Due to harsh working conditions, manual work and low wages, forest work is not attractive to youth and their employment in forestry has declined in many countries (FAO, 2013). Despite the potential of the forest sector to offer employment, targeted efforts are needed to on-board youth and offer them decent job prospects. This is especially important if the sector is to thrive and adapt to different transformations caused by digitalization, technological advances or the climate crisis. Training opportunities are also very limited in many countries, and even more restricted for women (FAO, 2013).

Larger companies, like pulp and paper companies that operate internationally, need to give heed to sustainability and corporate social responsibility issues and raw material and product certification requirements, and thus need to pay attention to working conditions and worker rights as required in the ILO international labour standards. These and environmental sustainability standards are also shaping the operations of the international tourism industry. Nature-based tourism and ecotourism often rely on good community relations and respect of local culture. However, decent work challenges in the tourism industry are common. They include informal work, vulnerability of low-skilled and unskilled workers, poor working conditions, low wages, inequality between women and men, long working hours, a high turnover rate, and limited social protection. Work is also often temporary or seasonal, and can expose workers to violence, exploitation, stress and sexual harassment. Women and youth are over-represented in tasks requiring lower skills, which is reflected in low pay, and higher vulnerability and uncertainty (ILO, 2017b).

5.4 Policy recommendations for increasing forest employment and decent work

Advance good governance and create an enabling environment

An enabling environment for developing forest-based activities and entrepreneurship is crucial for all forest-related economic activities, from smallholder woodlots and SMFEs to large international companies, and forms the basis for creating and supporting employment opportunities and decent work. Developing SMFEs has an important role in this as they provide most of the forest-sector employment globally and hold considerable potential for future development. While specific supporting conditions vary between the scale and nature of activities, some general issues are important across scales and actors. Along with adequate infrastructure and access to markets, these conditions include peace, stability and good governance, which involves the rule of law, secure and clear property rights, enforceable contracts, accountability and transparency, as well as curbing corruption and illegal activities.

Recommendations for supporting smallholder and community actors and small-scale forest enterprises:

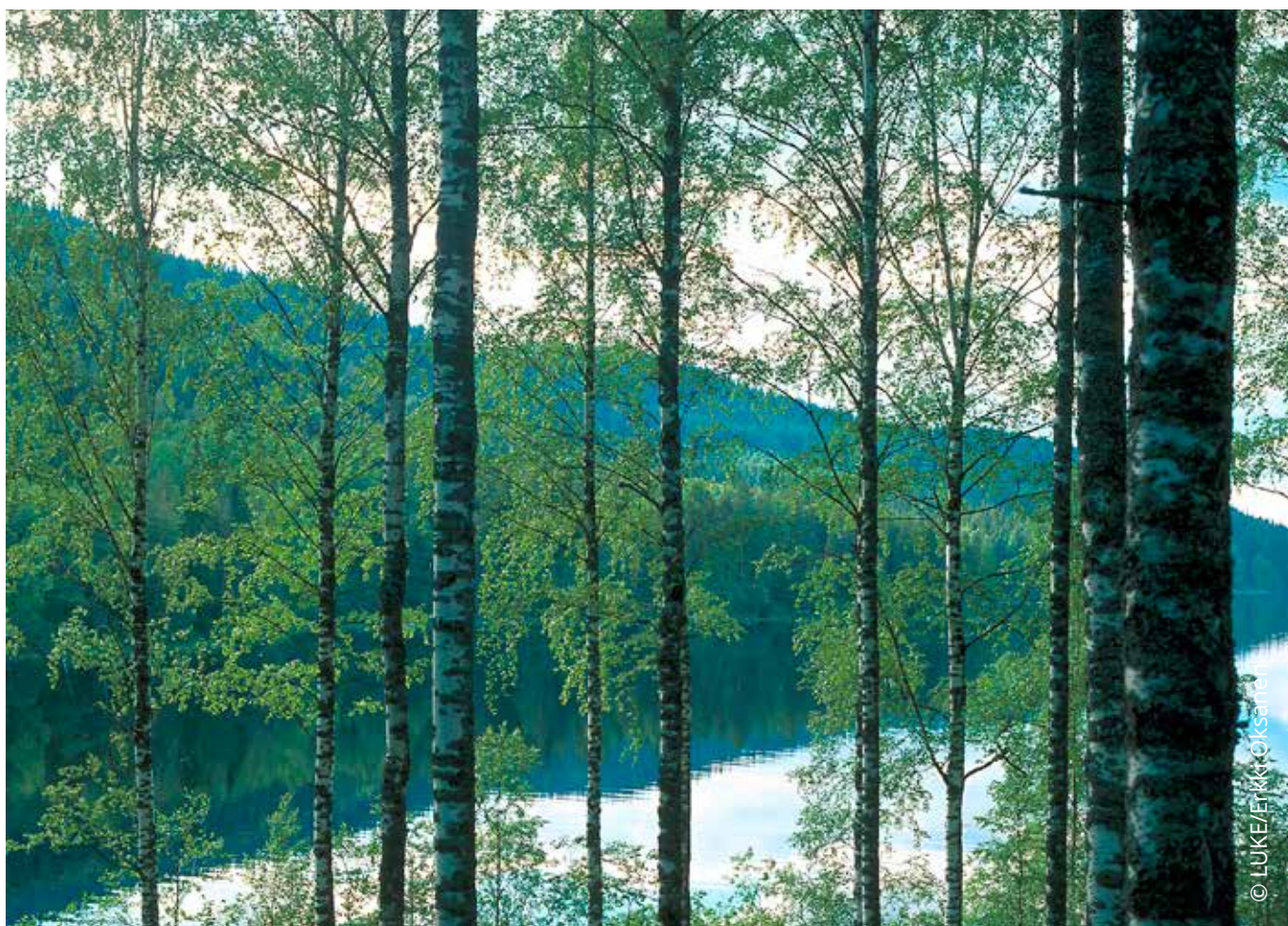
- Strengthening land and resource rights for small-scale producers, farmers and Indigenous and other local communities is a precondition for sustainable use and management of forests and investment in related economic activities. Their rights need to be protected and enforceable against outside actors, including the state, and include just measures and compensations when lands and forest areas used by local actors are allocated for forest concessions or plantations. The rights of women and youth should be specifically acknowledged.
- Encouraging the organization of forestry workers, forest producers and employers, including through participation in and/or formation of worker and employer organizations, FPOs, cooperatives or other social arrangements, is important for bringing together small-scale forest owners and communities to enable them to profit from new opportunities provided by technological innovation and digitalization that are out of their reach otherwise due to high costs and lack of capacities. These organizations can participate in social dialogue processes, and also strengthen the negotiation position and rights of workers, producers, employers and other sectoral actors. The organizations can also improve their access to credit and more remunerative value chains.
- Better integrating smallholders and communities in plantation development and restoration efforts and related activities and value chains, by involving them in seed collection, production of planting materials, tree planting, protection and management of restored or planted areas and in monitoring

their condition, as well as in timber harvesting and NWFP collection, and enabling them to benefit from planted/restored areas.

- Support small producers and SMFEs and their transition to formal economy and increase their productivity, including training and capacity building in entrepreneurship, organizational and managerial skills, sustainability and decent work issues, and improving their access to finance, markets and formal value chains. In particular, the capabilities of women and young people must be strengthened, and their participation opportunities supported.
- Build an enabling environment for smallholders, communities and SMFEs by simplifying regulations and bureaucratic procedures for drafting management plans, for obtaining harvesting and transport permissions, and for registering SMFEs. These are often drawn for large-scale operators and are unfit for and unnecessarily burden small producers and SMFEs (very bureaucratic and costly to follow) and drive them to informal and illegal activities.

Recommendations for supporting the investment and operational environment for medium- and large-scale companies:

- For attracting large- or medium-scale investments, decrease the investment risk of companies by paying special attention to development of well-functioning institutions, rule of law and social stability.
- Reduce operational risks by careful land use and land allocation planning to avoid conflicts and to guarantee availability of wood or access to other resources (nature-based tourism).
- Establish policy incentives (e.g. through active labour market policies) for companies to create employment and decent work opportunities for local residents and to include them in wood/timber value chains by developing just and fair out grower schemes or other partnership arrangements, which create benefits and income for local communities and smallholders including women and youth.
- Secure a sufficient and educated workforce in the future. In some countries, there is already a lack of competent workers, administrators and service providers. Enable the mobility of workers for



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providing labour where it is needed. To support mobility, advance international harmonization and recognition of competencies through establishing international sector-wide competency standards.

Improve sustainability and policy coherence

Continuing deforestation and forest degradation threaten biodiversity, the sustainable use of forests, and the uninterrupted provision of different forest ecosystem goods and services. This threatens sustainable forest-based employment in the long run. A fair, more inclusive and environmentally sustainable development model requires that economic growth is reconceptualized and decoupled from resource degradation and that the trade-offs between agriculture, forest and mining sectors are addressed in a fair and sustainable manner. Streamlining conflicting policies and eliminating policies that undermine sustainable forest management by enabling or even incentivizing forest clearing for agriculture and mining is important for securing an adequate resource base for future needs and future employment. In addition, the future of forests is also increasingly influenced by climate, energy, water and infrastructure policies as well as economic and investment policies. It is important to carefully consider the trade-offs among the different sectoral policies from the point of view of employment and take advantage of the possibilities for positive synergies in employment creation. The forest sector is also increasingly interlinked with other industries and a part of future forest-based employment will realize outside the traditional forest sector, such as the textile and construction sectors.

Recommendations:

- Increase coherence among different sectoral policies that are based on forests or affect forests, such as agriculture, forest industries, tourism, climate, biodiversity and energy policies, including non-traditional forest-based sectors that through process and product innovation use forest or tree-based materials (e.g. textile, chemical and construction sectors).
- Address the trade-offs among land-based sectors by improved land-use planning and land governance.
- Increase coherence among general economic, trade and employment policies and forest policies, paying special attention to employment creation and decent work issues.
- If aiming at substitution of non-renewable materials with wood products, create policies favouring sustainable use of wood over other materials (e.g. public procurement). Note that this can decrease employment in other sectors.
- Integrate and mainstream labour and decent work issues in forest policies, programmes and projects.

Improve information, education and skills

Lack of data and information undermines the development of policies and measures to support decent work and create employment opportunities in many countries. Responding to many of the above-mentioned development priorities relies on the availability of reliable information of the current situation and challenges, including information on informal employment. Tracking of changes in the forest-sector operation environment, investments and societal changes that affect the demand for forest-based goods and services is also needed for anticipating future changes and labour needs in the forest sector. Education and training programmes need to be developed and tailored to respond to the future needs in skills and capacities. Currently, lack of skills significantly restricts the development of the forest sector and production of higher value-added products in many lower income countries.

Recommendations:

- Better data and evidence are needed to support policy making, for example, better understanding of the current work and workforce (statistics, impact of policies in different circumstances, trade-offs) and future needs, as well as information on decent work issues and related deficits.
- Long-term plans for developing forest education and training. This needs to be based on a thorough assessment of current skills and age profiles and identification of current and future skill needs in different aspects of forestry and forest-related industries. These plans should consider the changing circumstances and related forestry labour needs in a bioeconomy and the increasing role of forest-

based services in relation to culture, health and nature-based tourism.

- Especially in low- and lower middle-income countries, increase training for developing the skills of forest and wood workers for improving productivity, work safety, job security, and for reducing negative environmental impacts of operations. Similarly, in nature-based tourism, skill development is important to enable the use of local service providers and the use of local inputs, thus also providing opportunities for women and youth.
- Capacity building on issues related to entrepreneurship, including financial and operational management and planning.
- Globally, more specialized forest management skills are needed to answer to the multiple demands for forests and the growing importance of different forest goods and services. This includes biodiversity, aesthetic and cultural values, and carbon sequestration into forest management planning and operations, as well as the capacity to adopt new technologies and more sustainable production methods. Forest workers and managers will increasingly need to have training to acquire skills needed for the ongoing transition in the forest sector and to take advantage of the opportunities offered by the development of the green/bioeconomy.
- New skills are needed for adopting green production processes and value chains in relation to new products, renewable energy and using wood in construction, research and development for new forest and wood-based products and services outside the traditional forest sector.
- Integration of scientific and Indigenous/local knowledge for developing forest-based value chains, NWFP harvesting and agropastoral and silvopastoral systems.
- Capacity building for inclusion and respect of the principles of free, prior and informed consent in all forest-related activities that affect local and Indigenous communities.

Improve social protection and decent work

Decent work is an important element of the Universal Declaration of Human Rights and should be fully acknowledged as such and mainstreamed within forestry work, and throughout forest-related value chains and industries. Specific attention should be paid to the most vulnerable groups, including women and youth. Ensuring social protection for forest-sector workers is challenging due to high levels of self-employment, temporary and seasonal work, subcontracting, and the pervasiveness of the informal economy.

Recommendations:

- Ensure that decent work aspects are mainstreamed across policies and that impacts on women and youth are considered.
- Eliminate child and forced labour in the forest sector. For this, agricultural, rural development and social policies that address poverty, food security and inequality are important.
- Eliminate all forms of discrimination and ensure equitable and just treatment regardless of gender, race or religion. Special attention should be paid to the most vulnerable groups. Tools towards this are context dependent but can include targeted programmes, policies, legislation, strengthening of the rule of law, and policy implementation.
- Ensure social protection to all, including informal, migrant, and seasonal workers and the self-employed. Extend national social protection programmes, particularly social insurances to formal and informal forest workers. Promote opportunities to advance social protection through FPOs or other civil society organizations.
- Ensure that businesses put into practice their responsibility to respect human and labour rights throughout their operations:
 - Ensure decent, equitable wages throughout forest value chains.
 - Promote formal, longer and stable contracts.
 - Improve forest workers' working conditions, safety and job security, for all workers and guarantee equal treatment and protection against exploitation to seasonal and migrant workers.

- Recognize and support the right to form and join trade unions and other social organizations that advance and support worker, smallholder, and local and Indigenous community rights, culture and livelihoods. Promote effective social dialogue in all its forms, including equal participation of worker organizations in negotiations between employers and employees.
- Expand forest and forest-based product certification schemes and codes of conduct that include social and labour issues. Encourage stronger integration of decent work issues in corporate social responsibility reporting.

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Box 1

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Box 2

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Box 4

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Box 5

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